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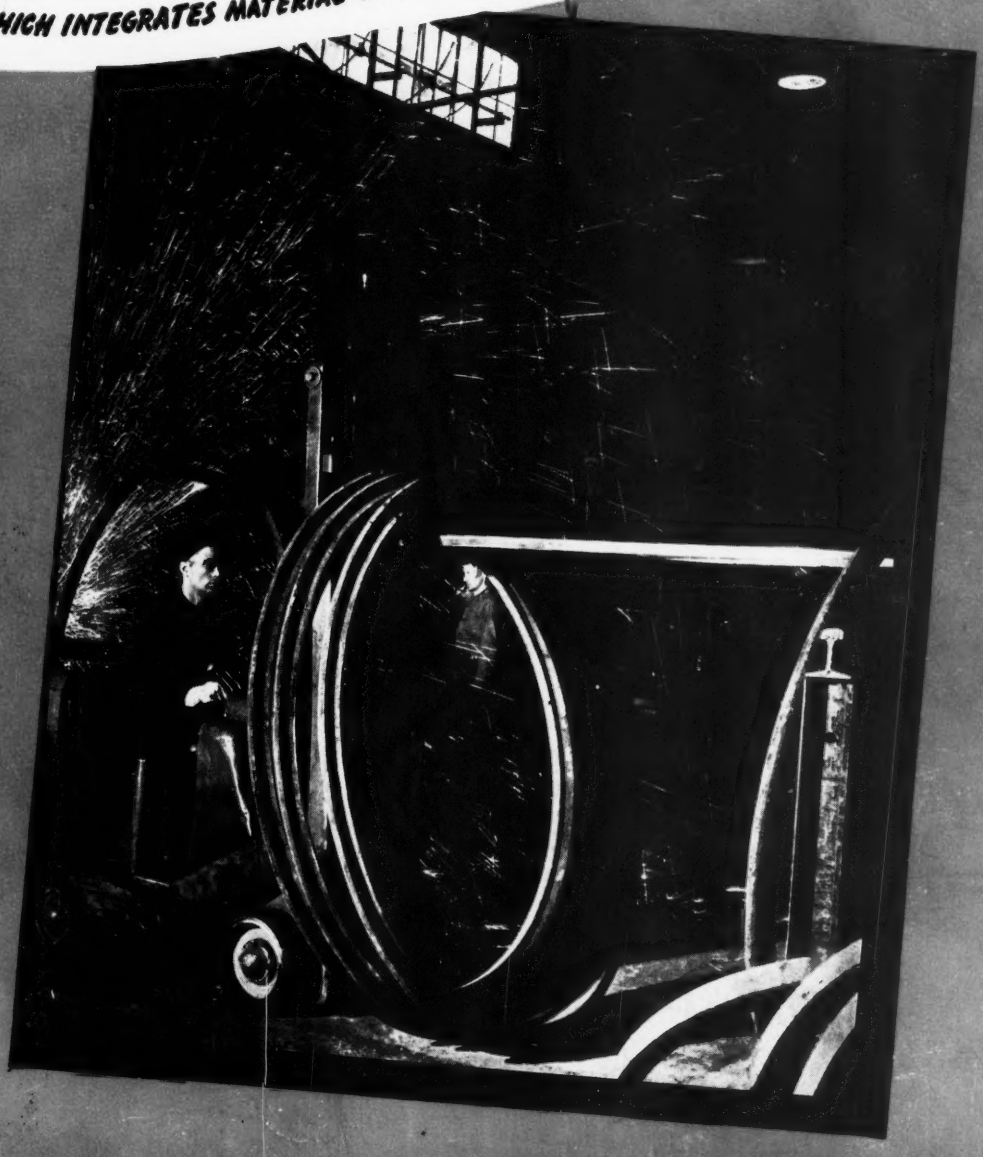
Flow

... THE MAGAZINE WHICH INTEGRATES MATERIAL HANDLING EQUIPMENT INTO THE FLOW OF PRODUCTION

OCTOBER
1946



IN THIS ISSUE:

Introducing the new "Where to Buy It Locally" Section. See pages 57, 58.
New Note in Lumber Handling . . . Vertical Storage . . . Hot, Heavy, Fast

v.R v.2 Oct. 1946 - Sep. 1947

WANTA BUY A *Conestoga Wagon?*

Genuine pre-war (Revolutionary) stuff . . . 24 ft. long . . . 5 ft. wheels. Can't use it around your place of business? Of course not—now that the compact, versatile, post-war Truck-Man is available.

$675.00
F. O. B.
Jackson, Michigan

The Truck-Man is dependable and efficient. Agile in crowded aisles and through narrow doorways. Gasoline powered, two speeds, easy to start, steer and stop. Handles skidded loads up to 2000 lbs. Hydraulic lift raises and lowers loads with a smooth cushioned action.

Ask for descriptive folder.

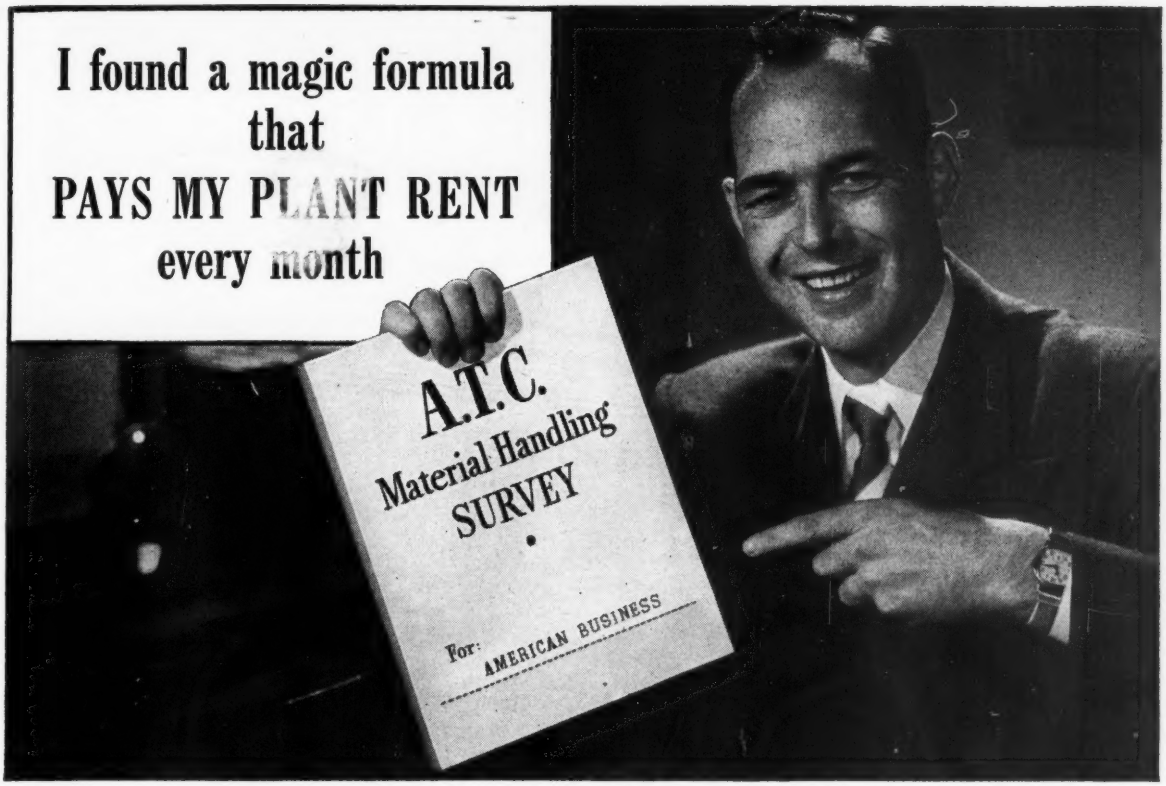
Limited Open Territory for Substantial Distributors

truck-man

a product of

YARD-MAN, INC.

1418 West Ganson, Jackson, Mich.



It showed me how to SAVE 60% every month on Material Handling!

I never paid much attention to material handling in my business. It was just so much overhead, and I paid through the nose.

Then an A.T.C. Specialist came into my plant and made a material handling survey. No cost, no bother, no strings attached.

About a week later, he handed me the folder you see pictured above. It was short and sweet—no complicated figures, no hocus pocus. The net of it was, I was paying 60% too much for my material handling . . . 60% overhead I could have been saving by using Automatic Electric Trucks instead of hand trucks and manual moving, lifting and stacking of material.

Now with these brawny giants of electric power at work for me, one man does the work of three, releasing two men for more productive work. We now lift, move and stack material ceiling high—get extra storage space—speed production, build morale with happier, safer working conditions.

That's the magic formula I found in an A.T.C. Specialist's Survey . . . a formula that saves me 60%—pays my plant rent every month, pays labor dividends in lightened, humane work. You may be able to save similarly in your business! At least let an A.T.C. Specialist survey your material handling. Mail the coupon.

Automatic
ELECTRIC TRUCKS
Lighten LIFE'S LOADS

AUTOMATIC TRANSPORTATION COMPANY
DIV. OF THE YALE & TOWNE MFG. CO.
141 W. 87th Street, Dept. T, Chicago 20, Ill.

Please mail me, without cost or obligation, complete facts about AUTOMATIC FORK TRUCKS.

( ) Have an A.T.C. Material Handling Specialist call.

Company Name.....

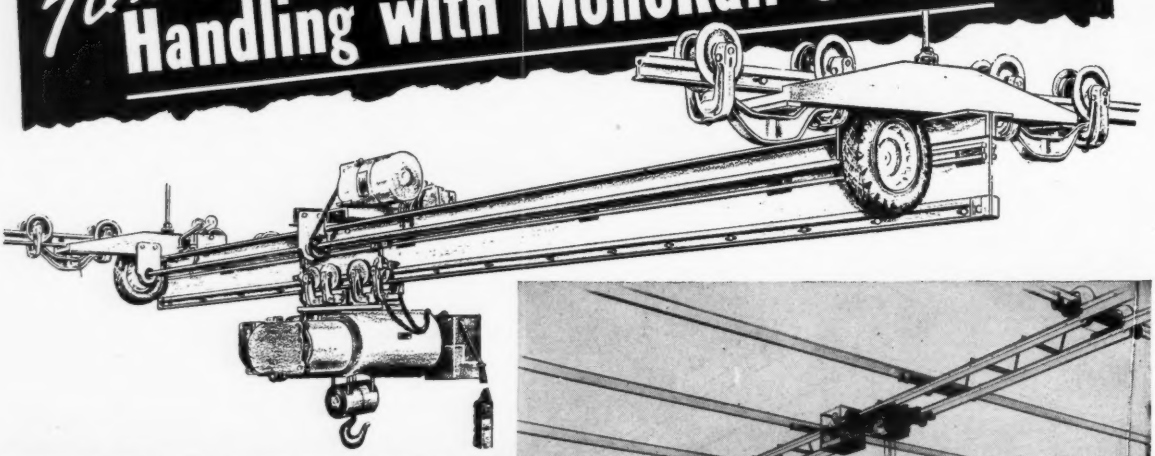
Kind of Business.....

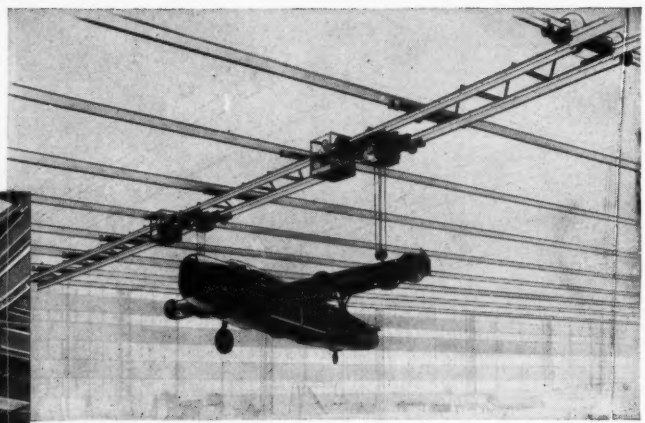
By.....*Position*.....

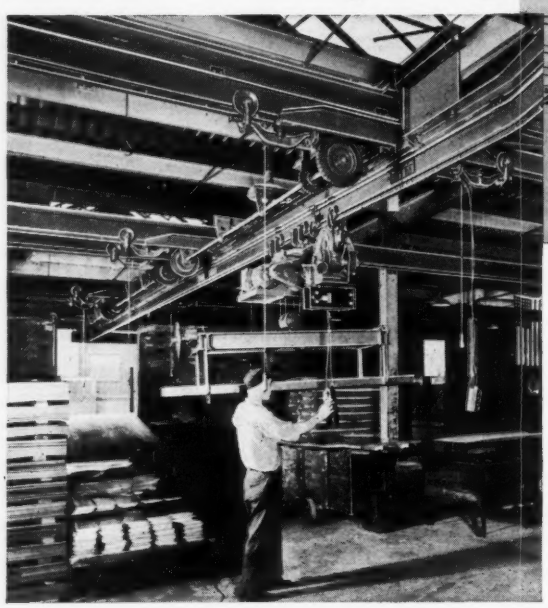
Street Address.....

City.....*State*.....

Flexible Handling with MonoRail Cranes

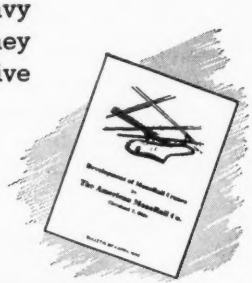






American MonoRail Cranes are not limited to bridging a single span. With their special interlocking and twin bridge designs, they supply over-all coverage . . . your handling is not tied down to alleyways or spotting or unloading near permanent equipment.

American MonoRail Cranes are available for any type of job — heavy or light duty — full automatic, cab controlled or hand operated. They can be installed under present operating conditions without excessive structural changes.



GET A COPY OF THIS BOOKLET! It tells the complete story of monorail crane development. Learn how cranes have been adapted to all kinds of handling operations. Ask for Bulletin MF-1.

THE AMERICAN MONORAIL COMPANY

13129 ATHENS AVENUE — CLEVELAND 7, OHIO

SERVING YOU THROUGH SCIENCE

WISE WAY TO SOLVE YOUR INDUSTRIAL TIRE PROBLEMS!

With U.S. Industrial Tires you'll have no trouble finding the *right* tire for the job. That's because the "U.S." line is so *complete!*

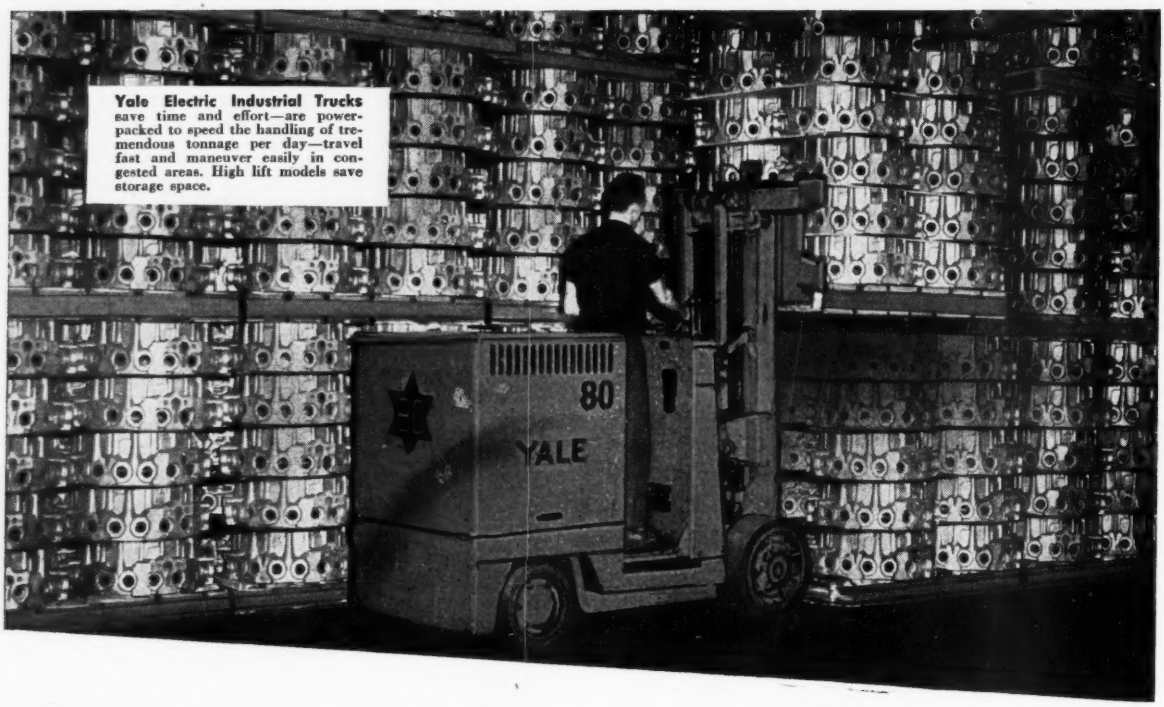
And no matter *which* tire you choose you can be sure of top performance, maximum wear. That's because *all* these tires are built for *quality*.

To top it all, they're backed by the skilled, on-the-spot *service* of your local U. S. Tire Distributor. His name and address is in the phone book. Look him up—*today!*

YOUR U. S. INDUSTRIAL TIRE DISTRIBUTOR HAS the right tire . . . the right service . . . for every job!

UNITED STATES RUBBER COMPANY

1230 AVENUE OF THE AMERICAS · ROCKEFELLER CENTER · NEW YORK 20, N. Y.



Yale Electric Industrial Trucks save time and effort—are power-packed to speed the handling of tremendous tonnage per day—travel fast and maneuver easily in congested areas. High lift models save storage space.

"High Sign" for Lower Handling Costs!

Let this picture be a "high sign" for you to eliminate "muscle money" from your payroll *now!* Let it point out to you how the *hidden costs* created by "muscle moving" can be wiped out—how you can cut handling costs, bring production to peak efficiency, and stack to new space-saving heights.

All can be accomplished by the planned application of modern material handling machinery such as fast, big-capacity, "safety first" Yale Hand Lift and Electric Trucks, Hand and Electric Hoists.

With such powerful, easily-operated tools, you can lift and transport enormous volume per day, keep high-speed machines well fed, step up output per man-hour, use storage facilities to best advantage . . . conserve worker energy, avoid the cost of wasteful rehandling, increase the safety factor for loads and workers.

Investigate! You'll find Yale Material Handling Machinery the "high sign" to lower costs and greater profits! Full information is yours for the asking. Just phone the nearest Yale representative or write direct.

The Yale & Towne Manufacturing Company
4530 Tacony Street Philadelphia 24, Pa.

Yale Hand Lift Trucks are ruggedly built for long life— provide easy lift, easy roll, easy steer —take the shorter hauls at a fast clip. Wide range of models and capacities for handling skids, skid bins, and pallets.

Yale Hoists—hand chain and electric models—are efficient time and labor savers that make light work of heavy lifting jobs—conserve worker energy, speed production and maintenance and cut handling costs.

Kron Springless Dial Scales, made by Yale, eliminate excessive time- and money-wasting handling operations, provide accurate, efficient, low-cost weighing and counting of all kinds of materials. Available in all types from bench to crane scales.

MATERIAL HANDLING MACHINERY

CUTS PRODUCTION COSTS... SAVES TIME... SAVES EFFORT ... PROMOTES SAFETY

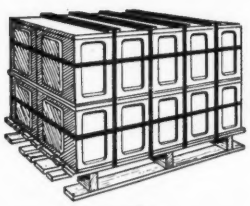
HOISTS—HAND AND ELECTRIC • TRUCKS—HAND LIFT AND ELECTRIC • KRON INDUSTRIAL SCALES

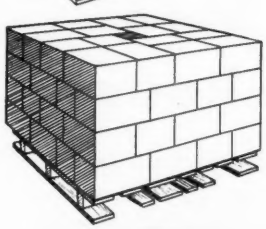
THIS OR THIS

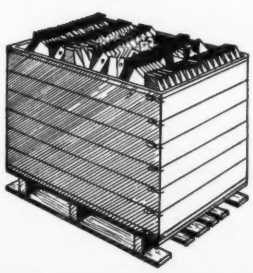
Generalift Pallets

★ ★ ★ ★ ★

SAVE 50% TO 90%







Throughout the war years, the armed services report numerous examples of 50% to 90% savings in materials handling through the use of pallets and fork lift trucks. Instead of picking it up and laying it down, moving it piece by piece —the "old bucket brigade"—many items can be consolidated into single loads, palletized, moved as *one.*

Result: one workman and fork lift truck do the work of many . . . reduce handling costs, save time and packaging materials . . . protect shipments from costly damage in transit . . . simplify warehousing and the taking of inventory (count pallets instead of single items).

That's why so many thousands interested in the speedier and more efficient handling of materials, components, and finished products are turning to pallets. That's why you too should check on this important subject *today.*

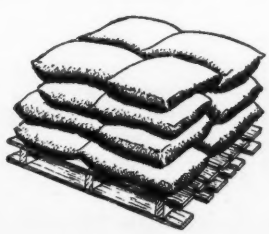
•

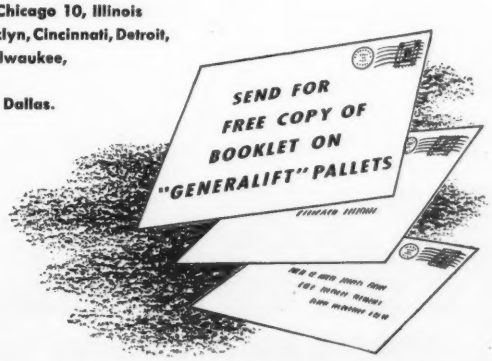
Generalift Pallets, Skids, and Lift Boxes are made of sturdy hardwood construction. Designed for long life, rough handling, extra heavy loads! Generalifts are made to meet your *specific requirements.*

ALL TYPES OF ENGINEERED SHIPPING CONTAINERS

GENERAL *BOX COMPANY*

GENERAL OFFICES: **60 West Illinois St., Chicago 10, Illinois**
DISTRICT OFFICES AND PLANTS: **Brooklyn, Cincinnati, Detroit, East St. Louis, Kansas City, Louisville, Milwaukee, New Orleans, Sheboygan, Winchendon. Continental Box Company, Inc.: Houston, Dallas.**





ECONOMIZE . . . PALLETIZE . . . GENERALIZE!

MOBILIFT "Rates" with the Men in the Warehouse

Ask the crew in any warehouse where Mobilift is in use. They'll tell you how much simpler, faster and smoother a Mobilift moves materials. They'll tell you, too, that Mobilift is safer and easier than the old "muscle methods" of the hand truck. And if you check with the superintendent, he'll tell you that Mobilift pays for itself many times over in lower handling costs. Join the thousands of plants that are cutting production costs with Mobilift.

SALES OFFICES:

34-48 Steinway St., Long Island, N.Y.
2430 South Parkway, Chicago 16, Ill.
107 Walton Street N. W., Atlanta, Ga.

MOBILIFT *Moves Materials like a Giant!*

VAUGHAN MOTOR COMPANY ★ 835 S. E. Main Street, Portland 14, Oregon

If You ARE ON THE MAP *You Get* GOULD SERVICE

Lead is still critically short, so you must conserve your batteries. Call Gould and ask for a Gould service man. He will help you set up simple and effective charging and maintenance schedules that lengthen battery life.

For further information write Dept. 710 Gould Storage Battery Corporation, Depew, New York. Gould manufactures all types of industrial storage batteries.

GOULD
KATHANODE and Plante
BATTERIES

The Battery Picked by Engineers

How

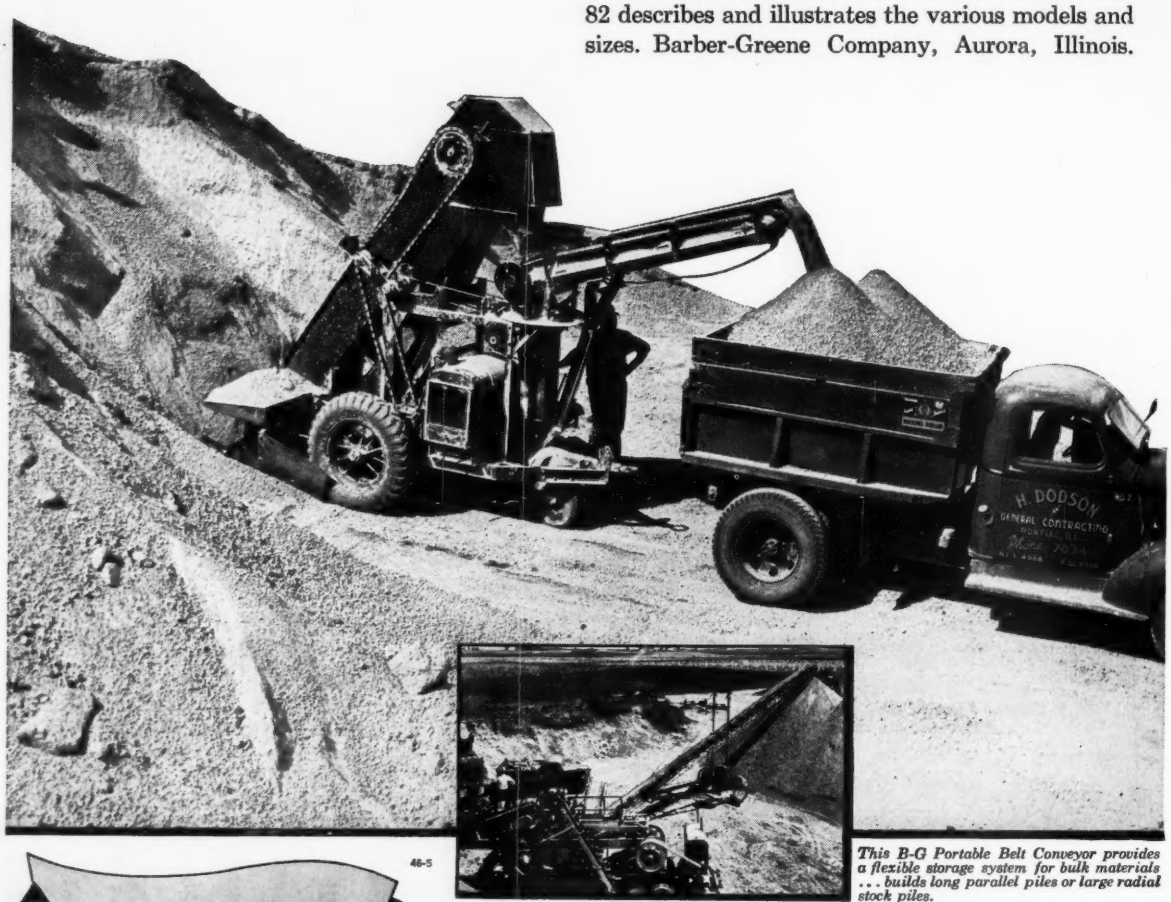
B-G Bucket Loaders

Save Truck Time

• Saving truck loading time is the equivalent of adding trucks to your fleet. And, Barber-Greene Bucket Loaders *are* saving truck time every day through their high capacity and efficiency in loading from stock piles. They're specially designed for this job—a job no other method approaches from the standpoint of saving time.

In addition, Barber-Greene Bucket Loaders are easily maneuvered around the yard or pit, and, where conditions warrant, can be equipped with a special high travel speed for moving from stock pile to stock pile.

The Barber-Greene Bucket Loader Catalog No. 82 describes and illustrates the various models and sizes. Barber-Greene Company, Aurora, Illinois.

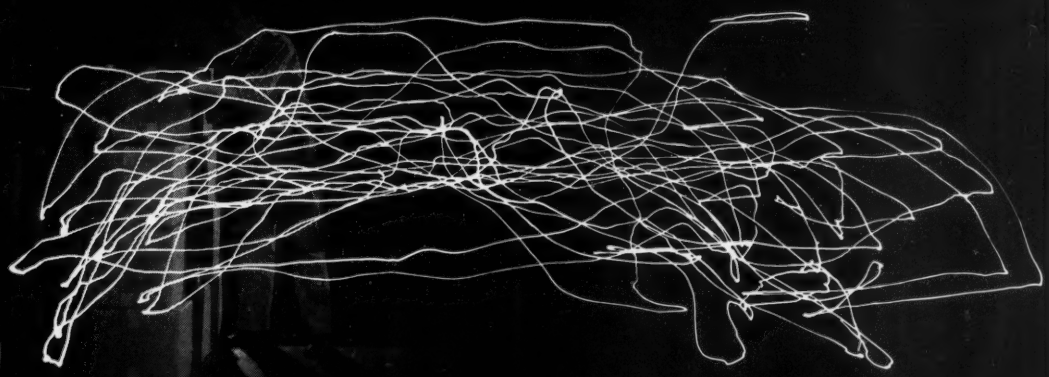


46-5

This B-G Portable Belt Conveyor provides a flexible storage system for bulk materials . . . builds long parallel piles or large radial stock piles.

Barber-Greene CONSTANT FLOW EQUIPMENT

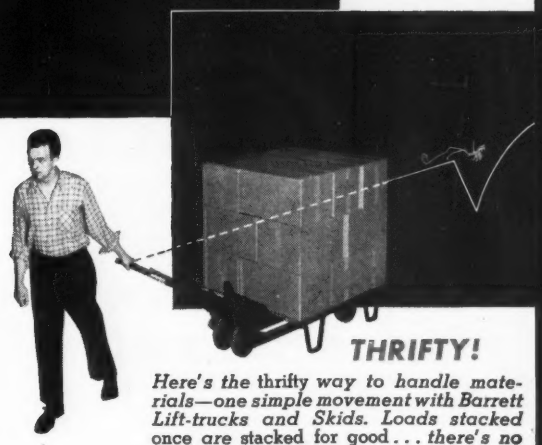
LOADERS • PERMANENT CONVEYORS • DITCHERS • PORTABLE CONVEYORS • FINISHERS • BITUMINOUS PLANTS • COAL MACHINES



COSTLY!

How many moves to pile a stack of boxes? In this authentic camera study, a bulb on the worker's wrist traces the complex pattern of his movements. When such moves are made repeatedly—as happens in so many plants—how costly the waste of time and manpower!

NEW LIGHT
ON WASTE MOVES!



THRIFTY!

Here's the thrifty way to handle materials—one simple movement with Barrett Lift-trucks and Skids. Loads stacked once are stacked for good . . . there's no costly reloading.

You can eliminate all this! All the waste time and effort shown by this actual photographic record. Barrett Lift-trucks and Skids end the delay that comes with repeated loading and unloading—piling and unpiling. As your materials move through production, or in and out of storage, the loads stay on skids—always ready to roll!

Working as a system, Barrett Lift-trucks and Skids take your material all the way—room to room, floor to floor, in and out of trucks—so swiftly and easily that *one man* handles more than *3 or 4*.

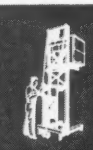
See how the Barrett System can end waste moves for *you*. A Barrett engineer will gladly show you how, without cost or obligation. Write for full details.

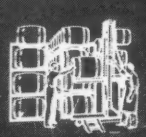
BARRETT-CRAVENS COMPANY
3257 West 30th Street • Chicago 23, Illinois
Representatives in All Principal Cities
Canadian Licensee: S. A. Armstrong, Ltd. • Toronto, Ontario

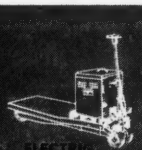
If you have a problem in materials handling, don't miss the Barrett Junior Catalog! A free copy is yours on request.

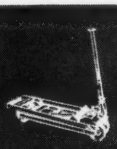
BARRETT
ONE MAN DOES MORE THAN 3 OR 4 . . . WITH A BARRETT

Barrett Handling Equipment


PORTABLE ELEVATORS


STEEL STORAGE RACKS


ELECTRIC LIFT-TRUCKS


HAND LIFT-TRUCKS

SKIDS

BARREL TRUCKS

LIFTY SYSTEMS

SALSBURY TURRETEER

HANDLES MORE TONS PER HOUR...CUTS YOUR COSTS

For complete information ask for Bulletin 4602-7

Horizontal movement of loads up to 4000 lbs. accounts for 70% of all handlings. This is where the Turreteer can save you money. It can do the work of 6 men with hand equipment. It's faster, more maneuverable than powered walking equipment. More economical and efficient than heavy-duty equipment.

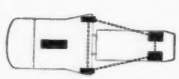
MORE MANEUVERABLE—because power unit and drive wheel rotate with turret for steering. Full 360° turn. Reverses simply by changing direction of turret without stopping drive wheel.

Salsbury 360° turning radius

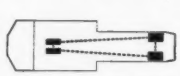
Conventional 200° turning radius

Turns in own length. This high maneuverability saves time in picking up, transporting and spotting loads. Result: it handles *more tons per hour.*

FASTER—because the Salsbury Automatic Clutch and Automatic Transmission permits constant movement without delays for gear shifting. Utilizes power as needed. With 4000 lb. load and driver, Turreteer will operate 2 to 3 times as fast as comparable use equipment. Takes steep ramps in stride. It handles *more tons per hour.*



Salsbury wide, 4-point load suspension



Conventional narrow load suspension

MORE STABLE—because of the exclusive Salsbury articulation which provides 4-point load suspension based on four widely spaced rubber-tired wheels. Permits operation over sharp changes in grade levels or uneven surfaces without tying on loads. Such time-saving stability means the handling of *more tons per hour.*

MORE EFFICIENT—because operator rides the load. Here is a gas-powered truck as simple to operate as any equipment made—throttle and brake are the only controls—no walking—no pushing—no fatigue. Operator can handle as many skids in the last hour as the first. Works 24 hours a day without stopping for battery charging. Cuts your costs because it handles *more tons per hour every hour of the day.*

For more complete information, send for Bulletin 4602-7

SALSBURY MOTORS, INC.

Pomona, California

A subsidiary of Northrop Aircraft, Inc.

Salsbury Turreteer—platform lift type • Salsbury Turretug—tractor type • Salsbury Turretruk—cargo type

Salsbury Turret Trucks

are available through any of the below-listed Factory Representatives

ALBANY—Stanley T. Smith, 119 State Street
ATLANTA—Rapids Handling Equip. Co. of Atlanta, 69 Mills St., N.W., Jackson 6206
BIRMINGHAM—Rapids-Standard Co., Inc., 503 N. 20th St., 7-8337
BOSTON—H. G. Davis, Inc., 8 St. Mary's St., Kenmore 5175
BUFFALO—Rapids Handling Equipment Co. of Buffalo, 2327 Main St., University 2786
CHICAGO—Madden Equipment Co., 5107 S. Ashland Ave., Yards 3233
CINCINNATI—Oral T. Carter & Associates, 305 E. 6th St., Main 2955
CLEVELAND—The Wallace Co., 1215 Swetland Bldg., Main 8431
COLUMBIA, S. C.—Rapids-Handling Equipment Co., Atlantic Coast Line Terminals, 2-0596
DENVER—Murray Sales Co., Wazee Market, Keystone 5297
DES MOINES—S. Riekes & Sons, 444 S.W. 5th St., 4-0149
DETROIT—Bentley & Hyde, 7310 Woodward Ave., Trinity 2-1180
GRAND RAPIDS—Rapids Handling Equipment Co., 100 Ionia Ave., S.W., 6-8674
GREENSBORO, N. C.—Rapids-Standard Co., Inc., 708 Guilford Bldg., 9769
HONOLULU—Peter K. Schubert, 801 S. King, Honolulu 59021
KANSAS CITY, MO.—Industrial Power Equipment Co., 1009 Baltimore, Victor 5977
LOS ANGELES—H. L. Stewart Associates, 923 E. Third Ave., Mutual 8159
LOUISVILLE—Robert L. Schmitt Co., 130 N. Bayly Ave.
MEMPHIS—Rapids-Standard Co., Inc., 845 Sterick Bldg., 5-2967
MILWAUKEE—Thos. C. Ingerman Co., 500 W. National Ave., Orchard 7600
MINNEAPOLIS—Frank N. Dodge, Wesley Temple Bldg.
NEW ORLEANS—Rapids-Standard Co., Inc., Room 407, Liberty Bldg., 315 St. Charles St.
NEW YORK—A. A. Moore Distributors, 92 Liberty St., Rector 2-3977-8-81
NORFOLK—Russ Equipment Co., 300 W. 21st St.
OMAHA—S. Riekes & Sons, 1402 Webster St., Atlantic 6860
ORLANDO, FLA.—Rapids-Standard Co., Inc., 709 Metcalf Bldg., 5154
PHOENIX—Diesel Motor & Equipment Co., 1279 S. Central Ave., 3-3416
PHILADELPHIA—Rapids Handling Equip. Co. of Phila., 679 N. Broad St., Poplar 5-2248
PITTSBURGH—Equipco Sales Co., 2227 Jane St.
PORTLAND—Oregon Handling Equipment Co., 523 N.W. Glisan St., Atwater 5792
RICHMOND, VA.—E. C. Evans, Insurance Bldg.
ROCK ISLAND—S. Riekes & Sons, 1216 First Ave.
ST. LOUIS—Harold W. Wiese, 731 N. Kingshighway, Forest 7333
SAN ANTONIO—S. Riekes & Sons, 1903 S. Flores, Garfield 6126
SAN FRANCISCO—Pallet Engineering Co., 625 Second St., Sutter 1963
SEATTLE—Packaging Sales Co., Colman Bldg., Elliott 8850
TAMPA—Rapids-Standard Co., 5609 30th Ave., 3-6508
TULSA—Cant Manufacturers Representatives, 3012 East 15th St., 6-5752
VANCOUVER, B. C.—Handling Equipment, Ltd., 1206 Homer St., Marine 9951

To FLOW:
Six At a Time

We would very much appreciate receiving six sling calculators offered by the John A. Roebling's Sons Company.

Should there be any charge for these we ould appreciate your advising us and we will forward U. S. funds to cover.—T. P. Kieran, Shawinigan Chemicals Ltd., Shawinigan Falls, Quebec, Canada.

These sling calculators were offered free of charge.—Ed.

To FLOW:
In Wide Demand

In your June issue of FLOW there is mention of a sling calculator, which is offered by the John A. Roebling's Sons Co. We would appreciate it if you would send us any additional information that you may have on this product. Send this information to Mr. H. B. Duffus, Safety Engineer at Westinghouse Electric Corporation, East Pittsburgh, Pa.

The above requests are but two of dozens that were received in response to the announcement published in the June issue.—Ed.

To FLOW:

We should like to take this opportunity of complimenting you on the constant improvement in your magazine.

Our organization is on your books for four subscriptions because each of our executives wants a copy to take home and digest.—R. M. Much and Associates, Industrial Engineers, New York City.

To FLOW:
Used for Instruction

It has been a pleasure, as well as informative and profitable to follow FLOW from its first issue. One enjoyable feature has been the ease of digging the articles out of the advertisements. This is not to deny the value of advertisements; on the contrary I have stretched each issue to the breaking point, passing it around among my plant layout students to suggest handling ideas to them from the ads. . . We have an average of about eighty students at all times in classes in Time Study, Methods, Plant Layouts and Materials Handling.—A. B. Cummins, Asst. Prof. of Industry, Wharton School of Finance and Commerce, University of Pennsylvania, Philadelphia.

To FLOW:
Steel and Coil Handling

Please send me an issue of FLOW showing steel room layout, also equipment used in unloading steel from box cars and handling to bins, and from bins to the machine shop. I am also interested in equipment for removing coil stock from box cars.—H. C. Porter, New York City.

The December 1945 and May 1946 issues are among those featuring articles on specific steel handling operations.—Ed.

To FLOW:
"Wealth of Sound Thinking"

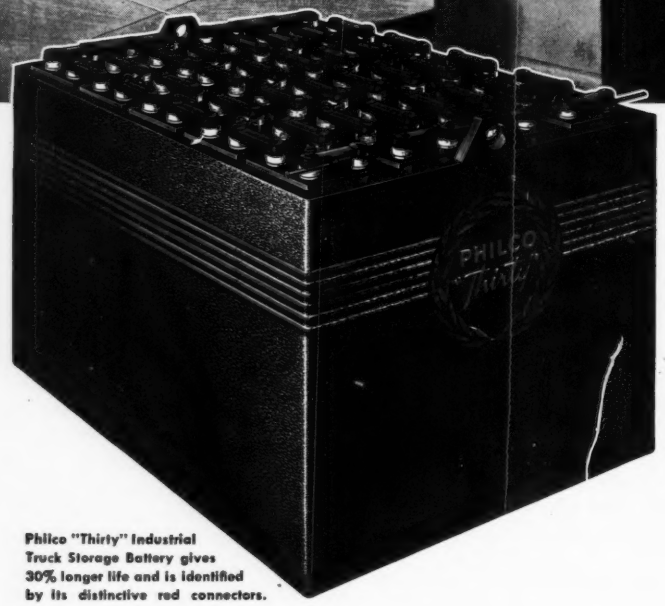
May I take this means of thanking your publication for a wealth of sound, bed-rock thinking and writing. It is refreshing, after all these years, to sit down and read concise experiences which parallel a person's own problems, or to read through premises which so clearly reflect a person's own thinking. The field of material handling needed FLOW long before it started. Here are sincere wishes for a long and happy life.—S. D. Miller, Lima, Ohio.

Engineer Miller is connected with a large corporation known for its advanced handling methods. His unstinted praise made a few editorial buttons pop.—Ed.

To FLOW:
Truck Forks

Is there a standard spacing and width for blades on fork trucks? Information is wanted on such a standard, if there is one, or on blade width and spacing of the leading makes of fork trucks. Since a pallet may be loaded in one place, warehoused in various places and by various industries, and finally dismounted by an entirely

(Turn to page 53)



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Flow

The magazine which integrates material handling equipment into the flow of production.

Vol. 2, No. 1

OCTOBER
1946

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LOUIS A. FLORA, Associate Editor

PRODUCTION DEPARTMENT
WM. V. LINAS, Director

CIRCULATION DEPARTMENT
E. J. HEXTER, Director

FLOW EDITORIAL AND BUSINESS OFFICES—
1240 Ontario Street, Cleveland 13, Ohio
Phone: Prospect 1251

NEW YORK OFFICE—LEE HAAS
60 E. 42nd Street, Room 950
New York 17, New York, Murray Hill 2-0488

CHICAGO OFFICE—NORMAN J. LOTT
64 E. Lake Street, Room 1110
Chicago 1, Illinois, Andover 4972

LOS ANGELES OFFICE—ROBERT H. DEIBLER
403 West 8th Street
Los Angeles 14, California, Tucker 1579

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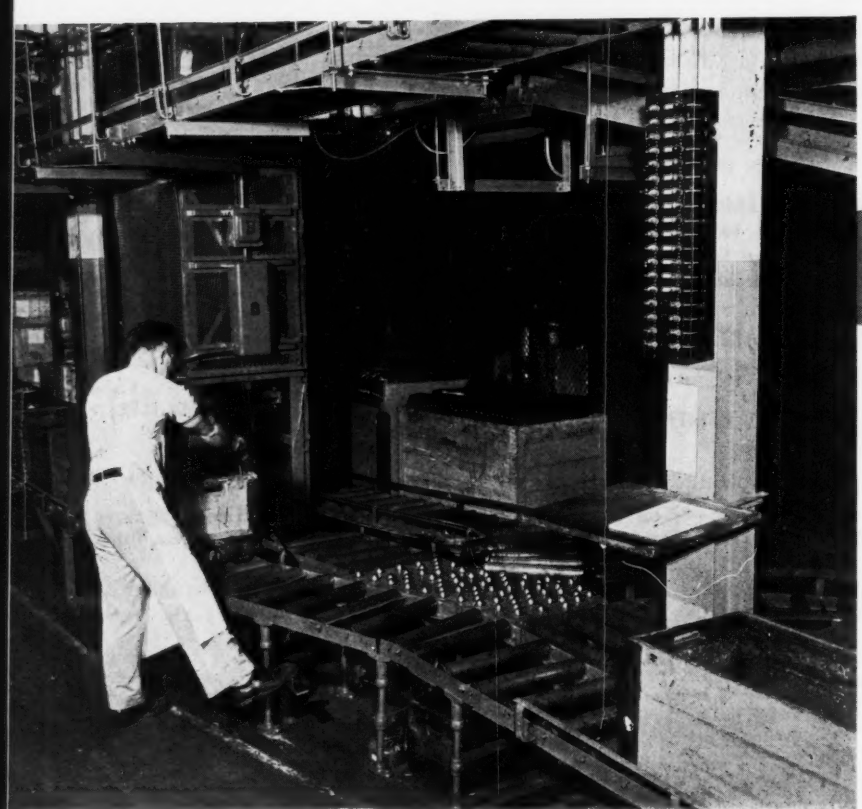
COVER PHOTO—The "fire works" in the background are from a flash welding operation, at American Welding and Mfg. Co., Warren, O. The fork truck is shown picking up a load of seven-foot rings, after welding, for movement to the heating furnace. The heated rings then receive speedy handling by fork trucks during the forming process. See the article on page 42.

ASSEMBLY *Flow* FOR SMALL PARTS

Modern electric cleaners are manufactured and assembled by the Hoover Company on a half-mile-long system of elevators, powered belts, switches, and monorails which are automatic.

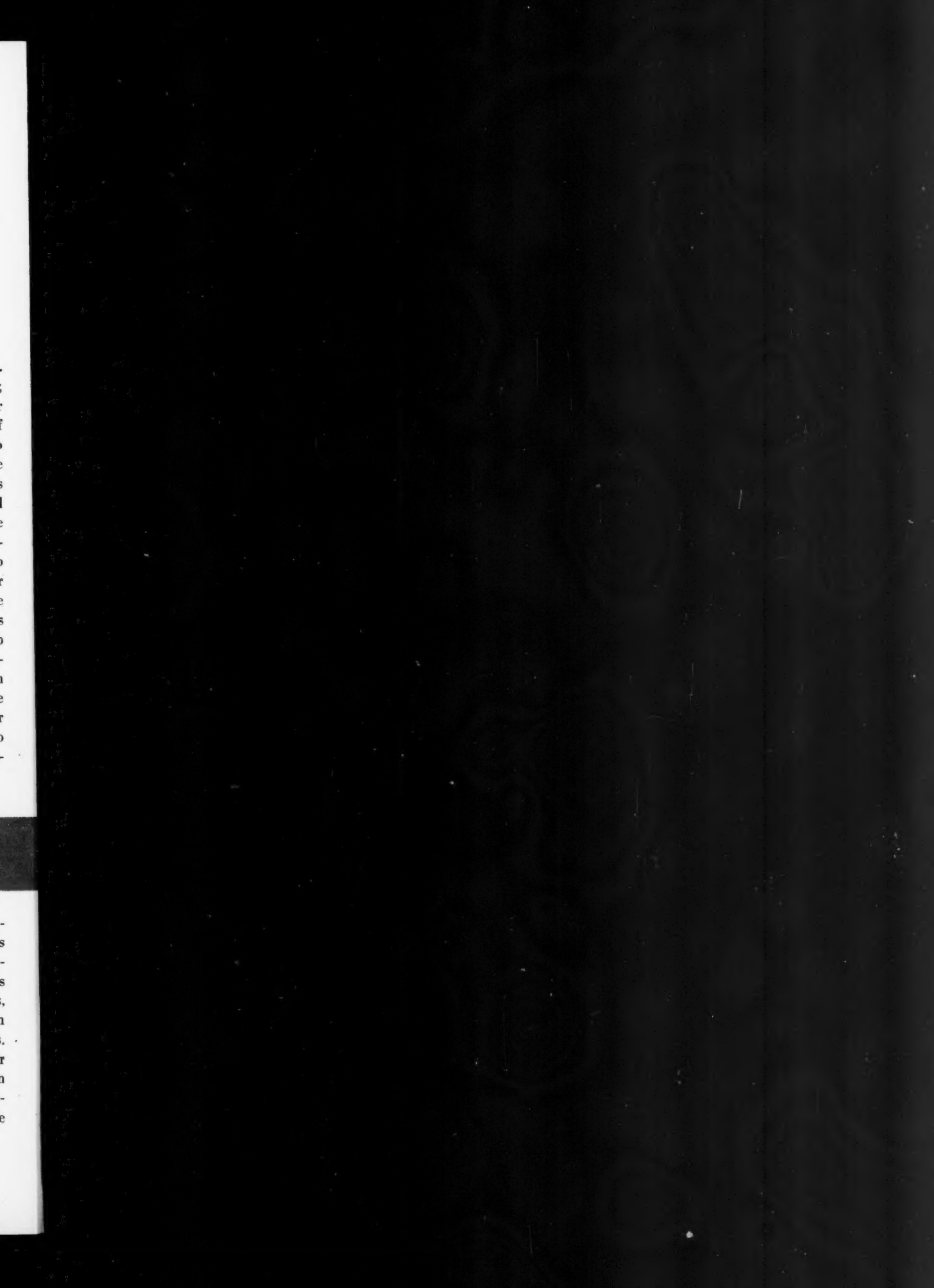
The Hoover Company at North Canton, transport the component parts, which go into the final assembly of its electric cleaners, in reinforced boxes which have sheet metal bottoms. In order to conserve valuable floor space, the company installed this line about three feet from the ceiling. One-half inch rods, threaded on each end and lagged to this ceiling on five-foot centers, support the conveyor while the other end is attached to the roller channel. Since the rods are threaded about eight inches back from their ends, raising or lowering the sections is done by merely adjusting the nut supporting the channel, thus providing flexibility.

The tote boxes are of two depths; one for the larger parts and one for the smaller. Across the top edge of each box at one end extend two one-inch strips of steel mounted one over the other about two inches apart. The top strip is perforated with 13 one-half inch holes while the understrip holes are about one-quarter inches in diameter. Into these holes is inserted a deflector pin whose location determines the destination of the box. These pins are of two lengths (for the two depths of boxes) and have a shoulder turned on one end to retain them at a definite height. The smaller diameter of this shoulder sockets in the lower of the two strips, holding the pin rigidly upright.

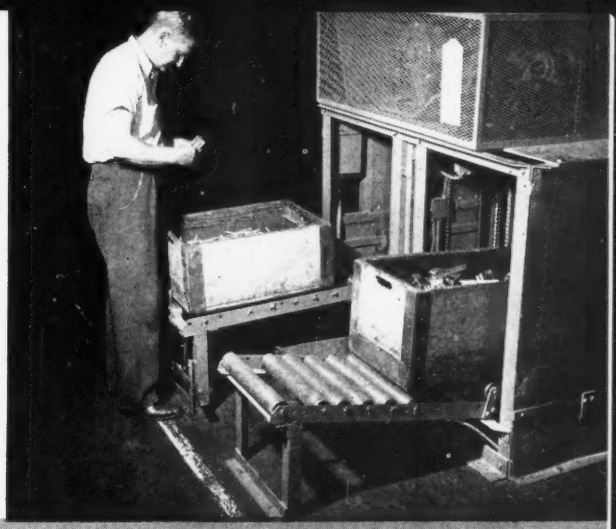


Operator placing deflection pin into proper slot for routing. Note stop and foot release.

To route a box to a predetermined station, the operator inserts the pin into the hole which is indicated on the master chart. This chart, shown in one of the photos, is posted at each loading station through which the conveyor passes. Incidentally, when the conveyor passes a loading point, the design provides a dip or elevator to working height and then a return to the



On-the-floor and overhead conveyor systems in conjunction with elevators to rear, above.



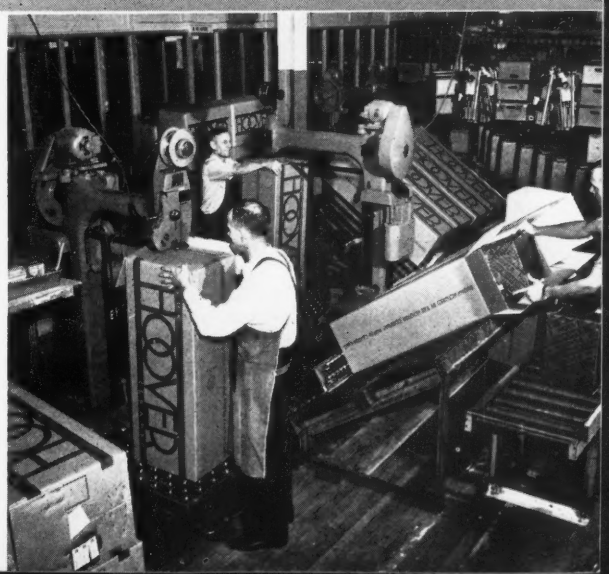
Component part inspection station with tote boxes arriving on elevator, right, above.

Motor assembly section showing tiered rotary tables for moving the units, below.

Motors being fed into testing compartment, above. The lower deck holds empty racks.

Final assembly section showing units passing to packing on cleated belt, lower, left.

Packing section showing angularly positioned conveyor with wheels at base, right.



former ceiling location. From this point, the box begins its journey over gravity rolls, switches, and elevators.

Positive Mechanical Switches

The deflector pin, extending from the top of the box about six inches, is the device which engages the mechanical switches to effect the routing desired. As the box moves into the switching zone, the deflector pin is thrust between the sides of a half-inch steel channel mounted above on a hinge. This channel is hung at an angle slanting away from the advancing box, so that the farther the box moves forward the higher the channel is raised. At the same time, the other end of the channel, which is pivotly mounted to a short lever arm, applies tension to a spring causing a deflector arm to switch the box. This system has proven itself valuable, because the switching is positive and does not fail to work.

In conjunction with the mechanical switching arrangement, powered belts are also used at several points. These belts are usually installed in pairs, one following the other. Two speeds are used on these belts; the first one propels the boxes at 20 feet per minute, while the belt following moves them at 70 feet per minute. In this way the boxes are carried quickly away from the switching zone, thereby eliminating any bottleneck with those coming from behind.

The location of the channels which engage the deflector pins can be positioned anywhere along the steel rod which passes through them, by merely loosening a set screw and sliding where desired. Hence, complete changes in routing can be made by this simple adjustment if departments are relocated.

Automatic Elevators

Of the five buildings in this layout one has four stories, which means that interfloor transportation could be a serious problem. However, by the use of automatic elevators, regular flow of material from floor to floor is maintained.

These elevators have a carrying surface designed with the same type gravity rollers as the main system, and are built to service different floors in irregular sequence if necessary. Limit switches are mounted a few feet from the entrance to the shaft, between the conveyor rollers. As the box approaches the elevator, it engages the switch which lowers one end of the gravity line, thereby allowing the box to come to rest on the elevator.

When the box reaches the desired floor, the roller lifting surface of the elevator tilts forward, allowing the box to roll away on an adjacent roller section. An interesting feature is embodied in this unloading device; instead of hinging the bed to which the rollers are attached, the elevator guides are hinged themselves. This arrangement permits depositing the box to one or the other exits of the elevator, although the guides are set for one direction only. This illustrates once more the flexibility which was built into the system.

Plastic Parts Move to the Line

The plastic department is located in a building adjacent to the one housing the main assembly line. Here the wheels, motor covers, and other plastic parts are moulded. To convey these items to the main assembly line, a powered chain-driven monorail conveyor is used. Hangers are mounted on 24-inch centers, to which are welded, on two levels, four trays. The trays on the upper level are for smaller parts such as wheels, while the lower-level trays are larger to hold motor covers and other large items.

This conveyor passes through the moulding department, dipping to waist height at the loading stations. From this point, the parts are carried to another floor for further processing, where they are removed for assembly. The empty trays then return to the ground floor to be reloaded in the molding room.

Intra-Departmental Handling

Most of the small sub-assemblies are produced on long working-height tables. As the parts are delivered by the main conveyor in tote boxes, they are deposited at designated locations for the sub-assemblies. When these are completed, they are returned to the conveyor for further movement to the next operation in the assembly.

An efficient method was developed in the motor sub-assembly section, to handle the part between operations while brushes, commutators, etc., are being added. An adaptation of the "Lazy Suzan" table was designed with five rotating surfaces mounted on a common vertical axle, with about an eight-inch space between each. Assemblers work on opposite sides of these tables.

At the beginning of this operation, after the first part is added to the motor housing, the assembly is laid on one of these tables and the operator rotates it until an empty space arrives. The worker directly opposite picks the part from the table and assembles the required pieces at that station. In turn, he lays the unit on the next series of turn-tables and rotates it in the same way, carrying it to the opposite side for another part to be added. This procedure is followed until the motor is complete.

The advantages of such a layout are many, but the most important are: 1. The space required is about one-fourth that required in a straight line setup. 2. Because of the five tiers, temporary storage can be maintained without a bottleneck. 3. It is an economical arrangement which requires a minimum of maintenance.

The motors are then "run-in" in

(Turn to page 40)

Mechanically Speaking

Booster motors used in the suspended line range from ½ H.P. to 2 H.P. with a ¾ H.P. rating on the deflector switch belts. The belt used is the standard heavy, impregnated type to maintain maximum pull and minimum wear. The belt used in the finished cleaner boxing section is four inches wide, 4-ply web woven type. It moves at 4½ feet per minute, activated by a 287 R.P.M. motor plus a gear reducer with a 100 to 1 ratio. In the main conveyor line, the rollers are steel, 2¼ inches in diameter, and are rated at 150 pounds per roller. They are 18 inches long and are mounted in three-inch channels.

The adoption of the unit package in this operation is paying dividends in savings—both at the shipper's and the receiver's plants.

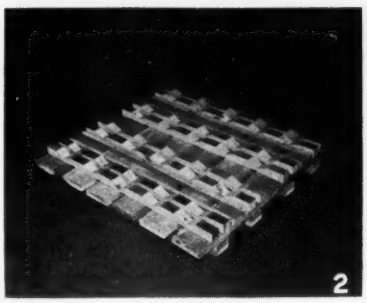
EIGHTY INSTEAD OF TWO

THE three photos in this series illustrate a profitable change-over in a receiving operation. The items pictured are motors weighing about 22 pounds each, which are used for oil-burning home heating units.

Photo No. 1 shows how the motors were received under the old

method—two packed in a carton. Since the receiver, The Heil Co., Milwaukee, Wis., uses them in considerable quantity, a good many manhours were required in unloading the containers from incoming trucks and then handling them in the assembly line.

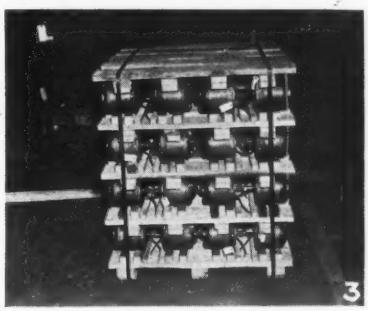
The Heil Company's material handling department made a study



of possible improvements, with the result shown in Photos No. 2 and 3. The single-face pallet was developed by the department, which then requested the supplier to ship in unit packages. This meant handling units consisting of 80 motors instead of only two.

Photo No. 2 shows the construction of the 40x40-inch pallet with the V-grooved blocks nailed to the pallet deck. The individual pairs of blocks are made up of 1-⅝-inch material, and the one-inch grooving permits the motors to nest securely. Each separator has the same arrangement of V-grooved blocks as the pallet deck.

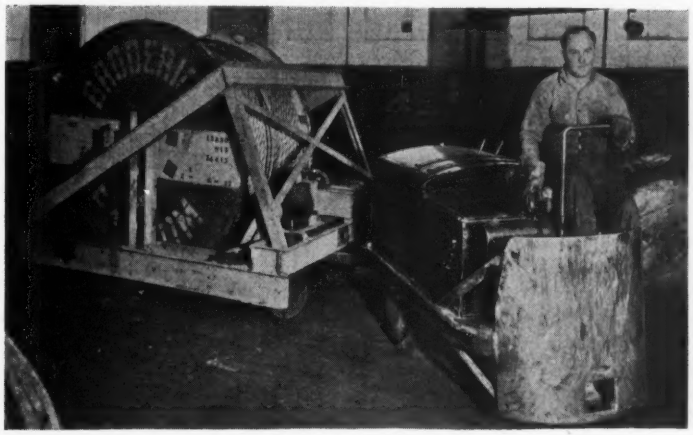
Photo No. 3 shows the top tray and the ¾-inch steel strapping applied. This end view shows the



2x4 pieces nailed to the outside edges on the underside of the separators, front and back, for extra security. No blocking is used at the sides. Twenty motors make up one layer, and the total weight of the unit package is approximately 2020 pounds. The company's material handling department reports gratifying gains in handling time and effort as a result of the adoption of this unit package. *Courtesy, The Heil Co., Milwaukee, Wis.*

REEL HANDLING

BULK, shape and weight are the main problems in intra-plant handling of eight-ton reels of wire rope. The photo shows how the Broderick & Bascom Rope Co., St. Louis, solved this problem. A specially designed reel-carrying trailer truck, coupled to an industrial tractor, now effectively transports these eight-ton loads from factory floors to the warehouse or shipping locations.



The two front wheels are designed to swivel in a complete arc in an area 17 feet wide. The reel shown holds 1,918 feet of 2¼-inch preformed wire rope netting a weight of 15,330 pounds. The trailer will accommodate a reel 76 inches in diameter and 40 inches wide. —Courtesy, Electric Industrial Trucks Association.

DETROIT PUBLIC LIBRARY

A New Note

By CARL E. JOHNSON,
Vice President, The Rudolph Wurlitzer Co.
General Manager, North Tonawanda Division

A new product, increased production and plant expansion posed a layout and materials handling problem for the Wurlitzer Company. Solving the problem led to the use of some novel features in moving large quantities of lumber.

ALTHOUGH the history of the commercial phonograph or "juke box" can be traced back to the 1890's, the real boom in the business began about 1933 and continued unabated until the second World War halted commercial phonograph production. Biggest producer of these machines is The Rudolph Wurlitzer Company, long established manufacturer of musical instruments, which started turning out "juke boxes" at its plant in North Tonawanda, New York, more than a dozen years ago.

Since Wurlitzer manufacturing facilities were, during the war, completely given over to production of war material, the company faced, in the reconversion period, a terrific demand for its peacetime commercial phonographs. Production had to meet this demand. And it had to prepare to satisfy an anticipated future market of greater size than ever before. At the same time the company was anxious to begin the mass production of a new instrument, an electronic organ whose debut had been delayed by the war.

These factors induced the Wurlitzer Company to undertake an ambitious program of plant expansion and layout revision. In the initial planning considerable emphasis was placed on increasing and streamlining wood handling and processing facilities because wood is a major item in the construction of both the commercial phonograph and the new electronic organ.

Plant expansion therefore took the form of a new building (now nearing completion) for the receiving, storing, and processing of lumber. The new building is so located that it will be in effect an extension of the original woodworking mill. Wurlitzer has developed some unique ideas for handling lumber in this new section, and these features are described in detail later in this article.

First, however, it is of interest to see how Wurlitzer production men and plant layout engineers have reorganized material flow to accommodate a production line for the new organ without sacrificing any of the production capacity required for the commercial phonograph. This can best be done by simply describing both the existing phonograph production procedure and the plan proposed to handle both products.

Phonograph Production Line

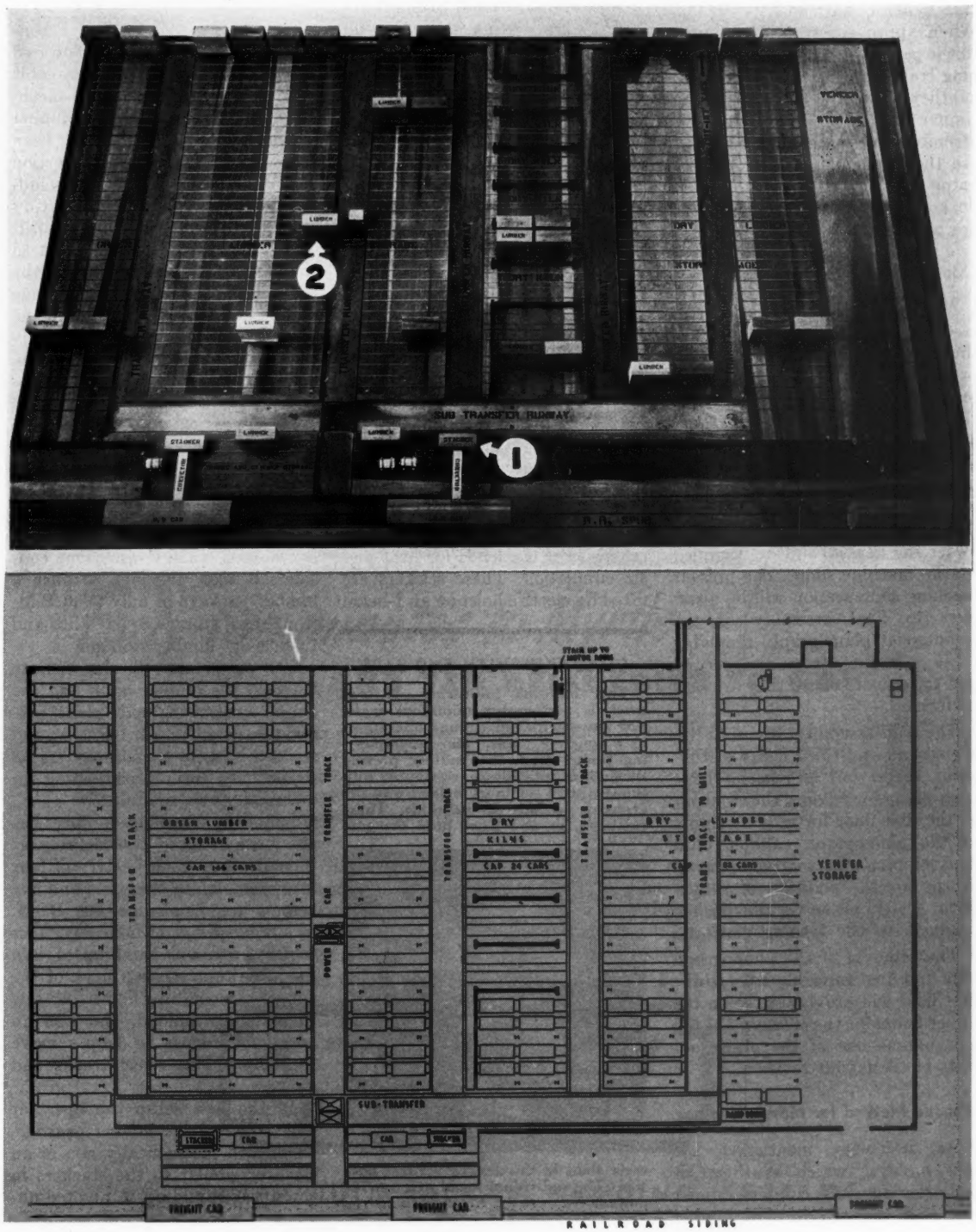
The existing phonograph production line efficiently utilizes practically all space available for production within the present plant framework. It operates in this manner. Raw lumber is received adjacent to the woodworking wing; the other wing is devoted to machining operations. The raw wood is stored in packages, separated by dunnage, until needed to replenish the production load. From raw storage it is manually transported on flanged-wheel cars operating on a three-rail system and delivered to a transfer car which moves it into position for entering the drying kilns. It is then moved manually from the transfer car into the kilns. On emerging from this seasoning operation, the cars are stored temporarily in the dry lumber storage section. The lumber is then removed by hand and fed through the saws and other wood working machines.

Once cut and milled to size, the cabinet and door sections are built up, glued and prepared for finishing. These sections are handled in skid boxes until assembled at the end of the first-floor line. From here the hollow cases are transported to the second floor where plastic trim sections are added, then to the third floor for installation of record changers and speaker units. The unit during this time is placed on wooden skids which carry it over a gravity roller system. The rollers

Detail layout drawing of new lumber plant, at right. Project is planned as part of postwar program for greater production.

IN LUMBER HANDLING

Three-dimensional model layout showing the sub-transfer car (1) in position at the stacker runway. The powered transfer car (2) is unloading a package of lumber in the transfer runway.



are approximately one inch in diameter and six inches long, mounted to support one skid runner on each side.

After final assembly on the third floor, the units are moved into the sound-proof testing room where they are adjusted for tonal blending and general operating efficiency. When approved, they are moved to the packing room. Here the shipping crates are placed around them as they move on gravity rollers similar to the ones used in the assembly lines. The crated units are then hand trucked to an elevator for delivery to the shipping dock on the first floor where they are placed in over-the-road trucks.

Manufacturing Division Relocated

Although actual production and assembly techniques are virtually the same as before, the new layout provides for relocation of several manufacturing divisions and considerable modification of material flow. With lumber receiving, storage and processing removed to the new building, extensive changes will be possible. The area now devoted to these activities will, under the new layout, be occupied by the machine shop. The present machine shop section will be given over to final assembly of the commercial phonograph, removing these activities from the second and third floors where they are now performed.

The sub-assembly divisions on the second and third floors will remain there, but provisions have been made for feeding their output to the first floor for final assembly in the phonograph cabinet unit. The shipping area will remain as is, except for the addition of a conveyor system to deliver the finished products to the loading platform.

The removal of the phonograph trim and final assembly lines to the first floor will provide space on the upper floors for the assembly of the new organ—one of the prime objects of the layout revision.

Unique Method for Moving Lumber

As previously mentioned, the new building which Wurlitzer is constructing will combine under one roof the activities of lumber receiving, storage and processing. The mechanical lumber handling system designed for this building is of particular interest, and it is one that could be readily adapted for smaller quantities than are required at the Wurlitzer plant.

The capacity of the new storage building is 1,260,000 B.M., of lumber with an additional 70,000 B.M., in the storage bank at the cut-off saws. The twin stackers and conveyors at the railroad siding will handle the unloading of four carloads of lumber per eight-hour day (approximately 80,000 B.M.).

The stackers are actually elevators which travel downward as each layer of planks is laid until a package of lumber is formed 6 feet wide by 16 feet long by 10 feet high, containing 5000 B.M. This is 2000 B.M. more than the old method of piling where the load was stationary with the handler rising with each successive layer. In the new and safer setup the handler will always remain at the same level on top of the stacker, taking the lumber from the adjustable gravity roller conveyor between the railroad car and the stacker.

Between each layer of boards are stacking sticks, forming spaces crosswise of the loads for heat and air circulation. These stickers are lifted by electric hoist on an I-beam track from the kiln truck and stacker storage track to a position easy for the handler to take and lay in a removable spacer slot frame around the stacker, so that when the loading is finished, the elevator stacker rises and a neat package of lumber is ready to be stored in the green lumber area.

Operating in the transfer runways will be a gasoline-powered transfer car equipped with a cable pull and also a pusher arm mechanism for handling the lumber package on and off the car from the stacker tracks to any portion of the lumber storage area, including the dry kilns and to the cut-off saws located in the plant proper. The tracks are all in alignment so that the power car can transfer the lumber packages from one storage section across the runway into the next storage section without changing position. These various runways are all tied in with a sub-transfer runway having a car with tracks over which the power car runs, and is positioned so that power is transferred to this sub-transfer car which then carries the power car to any transfer runway desired.

A considerable saving in lumber handling is realized when one considers it took five men to push a lumber package of only 3000 B.M. from green storage to dry kilns and then to dry lumber storage.

The power car will also operate between the lumber bank and the cut-off saws in the main plant, taking the empty kiln trucks and stickers back to the storage tracks adjacent to the railroad siding for use again at the stackers.

Labor in handling lumber has also been reduced considerably at the cut-off saws. A battery of four saws needed four operators and five helpers and handled 20,000 B. M. of lumber per eight-hour day. This required manual handling of kiln car-loads to a position back of the cut-off saw and one helper per saw to manually unload, and also an additional helper to help remove the empty kiln wheel trucks and stickers.

In the new setup the operator will be facing the lumber package, which will mechanically rise in an elevator similar to the stackers in the storage building. A pivoted unstacker mechanism will set it in

(Turn to page 40)

STEEL SKID WITH END BARS

This high-lift industrial platform truck is performing numerous material movement and storage operations in a concrete plant. The accompanying photo shows it handling pressed steel skids which are equipped with tubular steel retainers welded into the grooved portions of the skids. These retainers, or end bars, hold the concrete slabs in the desired vertical position. The individual loads weigh 6,720 pounds.—*Courtesy, Electric Industrial Truck Association.*

Forty-five minutes to Myrtle

AND TEN DELIVERIES TO GO!

Put yourself in Joe's place up there in the truck. You've got just forty-five minutes to make the last ten deliveries and meet Myrtle. If something's going to get busted, it better be one of the deliveries . . . not the date.

Now climb down out of that truck and face some of the facts of life and of shipping. The human factor is always a shipping hazard . . . and the Stanley Steel Strapping System assures the protection you need for your shipments. No matter how you ship . . . case, crate, carton, bale or reel . . . this system makes good on your promises of safe delivery . . . maximum protection for minimum weight. The System includes tools, reels and accessories for every application.

There's no end to the time-, labor- and money-saving uses of Stanley Steel Strapping . . . for cases, pallets and bales . . . or of Stanley Car Banding for reinforcement of shipments in freight cars.

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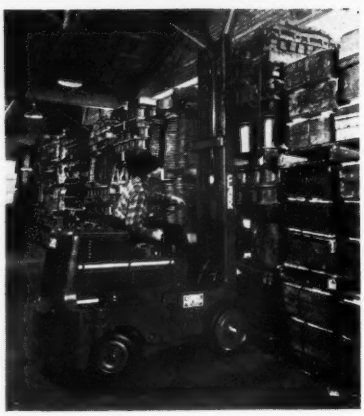
STEEL STRAPPING AND CAR BANDING SYSTEMS

VERTICAL STORAGE FOR CASTINGS

Receipt of a large volume of variously sized castings and/or forgings sometimes creates a storage problem that results in floor congestion. Here is how The Heil Company, Milwaukee, Wisconsin, has solved a similar problem.



Above: A ton of castings, assorted in stacking box, is being placed in storage—approximately 10 feet above floor level. Right: High-lift fork truck handling load of bulky and odd-shaped castings, which are stored on pallets.

A DIFFICULT storage problem at The Heil Company was solved successfully by adoption of stacking boxes, shown in one of the photos, which enabled the company to make effective use of overhead space, this saving valuable floor area needed for production purposes. This metal fabricating plant, manufacturing a wide range of products that serve 125 different types of industry and business, receives thousands of tons of rough castings annually. Scores of different types of these items are involved. Of many different shapes and sizes, the weight of the individual pieces varies from two or three pounds to 50 pounds or more.

Flexible, Convenient Handling

At the receiving point the material is assorted into the stacking boxes shown. These metal-bound containers (with steel legs) are about 30 inches wide, 42 inches long, with an over-all height of 30 inches. The underclearance of 9½ inches permits these boxes to be moved by fork trucks, platform truck, or by motorized hand trucks to storage. The fact that these boxes can be picked up either from the ends or the sides (four-way entry) makes for added flexibility and convenience in handling.

The loaded units may weigh anywhere from 1,000 to 4,000 pounds, and they are usually stacked four high, placing the top of the fourth box about ten feet from the floor. As can be seen in one of the photos, the metal upright at each corner is slightly flared at the upper end and extends about 1½ inches above the top of the box. This provides a retaining unit for the legs of the next box tiered on top.

The Heil Company uses about 700 of these boxes, which are arranged in seven aisles in a space comprising approximately 4,800 square feet of floor space. You can readily see that several times this amount of space would be needed with on-the-floor storage.

Simple Location System

The location system which the company uses is as efficient as it is simple—another point of the operation that may be helpful. Each aisle is marked alphabetically, beginning with "A", and each vertical row in every aisle is marked numerically. Thus "A-1", "A-2" and "A-3" would indicate the first, second and third rows in

the first aisle. This identification is tacked to each box by use of a 4x5-inch card. Also noted on the card is the part number as well as the number of pieces in every container. For example, if 704 pieces are in a given box and 50 pieces are removed, the operator will note that the contents of the box are now 654 pieces. The perpetual inventory kept is an advantage when a piece count is made periodically for stock control purposes. The tedious, time-robbing job of counting every piece in every box is avoided; all that needs to be done is to read off the number on the stapled tag.

The office maintains a file of the location cards, which are also kept up to date as to piece count.

These boxes are well adapted to scores of types of castings, which are in the "small" and "medium" size range, as previously indicated. They would not be suited to certain kinds of larger and bulkier castings. As can be seen from the second photo, this heavier material is palletized.

Several Advantages

With the loads stacked 10 feet high, valuable floor area is used efficiently. Once the material has been placed in the boxes or on the pallets, rehandling of many small individual pieces is likewise avoided. From storage the material is moved in sizable loads to machining or other production departments. Accessibility of the stock is another advantage, which was pointed out by a company representative. With on-the-floor storage, on the other hand, numerous loads must frequently be moved in order to reach the one needed. And, in addition to the simple and efficient inventory control provided, the vertical storage system also offers the further advantage of greatly improved appearance and safety in handling.

If you have difficulty in storing similar small parts, the chances are that a vertical storage system is the solution to your problem.

(Next month FLOW will present an article on an interesting overhead handling operation in one of The Heil Company's production lines.—Ed.)

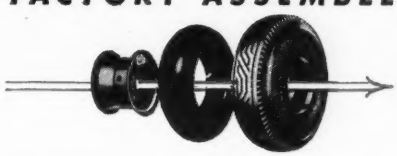
WHETHER YOUR INDUSTRIAL HAULING JOB IS *Big*—

. . . OR *Small!*

Plan future equipment to include General Industrial Tires and you'll cut material handling costs 5 ways.

1. ***Generals move material faster*** . . . efficiency saves labor, *speeds production.*
2. ***Generals move loads easier,*** over rough, smooth or soft surfaces . . . *stop spillage, breakage.*
3. ***Generals cushion load & truck*** . . . avoid equipment breakdowns due to *jarring and jolting.*
4. ***Generals end excessive floor wear*** . . . do not cut asphalt, linoleum, *cannot cut or chip.*
5. ***Generals reduce maintenance*** . . . handtrucks and cargo wagons *stay in service.*

FACTORY ASSEMBLED



WHEEL • TUBE • TIRE

DEPT. 7
THE GENERAL TIRE & RUBBER COMPANY
Akron, Ohio

The GENERAL TIRE

INDUSTRIAL PNEUMATIC TIRE • TUBE • WHEEL UNITS

This VALVE handling operation is designed for

With the many irregularities which are present in the outer contour of valve body design, handling and stacking can be a problem. Here's how the world's largest manufacturer of lubricated valves moves them by use of standard equipment and special accessories.

By ERNEST FALLOWS
Production Manager
The Rockwell Manufacturing Co.
Pittsburgh, Pa.

Positioning valve bodies stacked in a skid bin with powered hand lift truck. Note plywood inserts between the layers.

Operator milling flats on plug, with a loaded skid bin supplying the material. Wire baskets (to rear) hold the parts as they move over the roller conveyor.

IN ANY handling operation involving material of irregular or sharp contours, certain problems are present. Valve bodies are made in two styles: a screw type and a flange type. These protrusions afford about the only "setting down" surfaces on the whole item, and this fact is utilized in the handling of the valves we manufacture.

Care for Costly Parts

Aside from that feature of handling, the care and protection of the machined faces is also very important. We have made a standing rule that all valves which are stacked during movement in the plant must have a wood or corrugated paper insert placed between the layers. This insert not only protects the machined sections, but also provides a much more stable load, especially when the pieces are rough. With some of the valves weighing upward of 125 pounds each, you can appreciate that an unsteady skid load would be a hazard.

The valve bodies (outer housings) and valve plugs (operating inserts) are delivered as rough castings to our receiving department. The bodies are placed in metal skid bins and moved either by hand skid-lifters or by powered platform truck to storage, from where they are requisitioned for production.

The valve body line and the plug line run parallel to each other with a gravity roller conveyor system between. This system not only makes use of the central portion

MAXIMUM [Output Protection Safety

Special hand truck carrying bodies to be repaired. Handle provides means of guiding through aisle and at machines.

Assembly section for valves and bodies. Note vises mounted on the slat conveyor, as shown in upper photo, at right.

of this machining section, but aids the foreman in keeping close contact with all the machining on both parts before assembly.

The bodies have a small locating pad cast on them (used as a point of reference) which is milled in the first operation. The parts arrive in skid bins handled by platform truck. After the body is milled, if it is a screw type valve, the pipe ends are tapped. If a flange type, it is placed directly on a flat wood pallet which rests on the gravity conveyor. For movement through washing, reaming, and drilling flange holes, the pallet-on-gravity roller system is used.

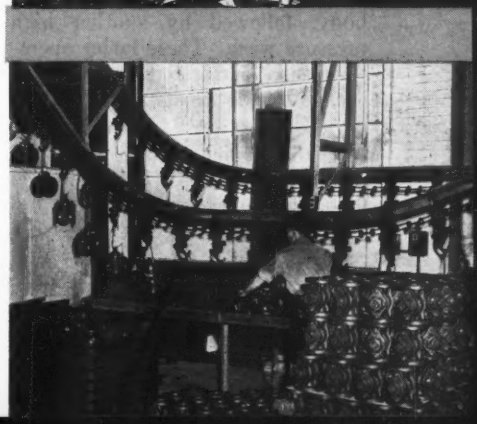
The remaining operations on the body before assembly of the plug to it are done on steel tables. The assembly consists of inserting studs and a washing operation, followed by inspection. The operations are planned so that the operators can pass the parts from one to the other in a continuous flow.

Wire Baskets for Plugs

As was mentioned, the plugs pass on the side opposite to the body line. In the first operations of centering and drilling, turning and tapering the shank, the plugs are handled in skid bins. These are moved by hand skid-lifter which makes possible flexible positioning between machines in confined space.

Since the valve plugs are the operating insert in the valve body, the one end has wrench collar flats milled on it. This operation starts the plug on its way on the gravity system across from the body line. The plugs are carried in wire baskets rather than on pallets over the rollers. These baskets permit the plugs to be set on their ends which, incidentally, are not machined. This eliminates stacking the units one on the other with the

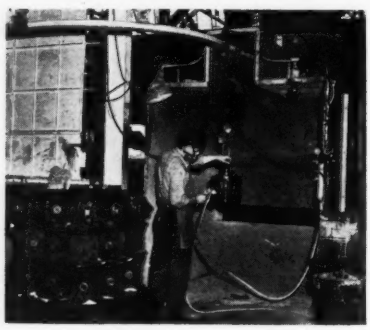
Hoists mounted on a monorail moving large valves during an assembly, right, above.



Overhead monorail conveyor meeting the belt conveyor in the shipping room, right.

possibility of marring the surfaces. The baskets are shown in one of the photos.

As the plugs pass through grinding, re-centering, groove milling, drilling, and washing they remain on the gravity line in the wire baskets. The washing operation involves some interesting handling as the same procedure might be used in other lines. The gravity rollers



Large valves easily handled during painting with the aid of a monorail hoist.

run through a sheet metal housing (which encloses them) containing a set of spray nozzles. The angle of the conveyor is such that a steady even flow of baskets, one against the other, is maintained through the washing operation.

When the plugs emerge at the discharge end, an inspector removes the baskets and checks the accuracy of the operations up to that point. Following this inspection, the plugs are routed to the assembly section to join the valve bodies.

Vises on Slat Conveyor

Two operations are performed in fitting the plug to the body, and since the two valve parts now proceed as a unit, skid bins are used to hold them. The first operation is a rough fitting of the plug to the body with subsequent washing in a high pressure agitation bath. The second is lapping the plug to the body, followed by another high pressure wash. These latter operations are performed opposite to each other so bench handling can be utilized.

As the washed units are removed from the bath, they are inspected for any imperfections before the final assembly. Rejects are either returned to the main production line or scrapped if beyond repair.

Five closely allied assembly operations are performed in the adjacent section, so we have tied them together in the following way. A slot conveyor was installed with the slats measuring about 8x12 inches. To these were fastened standard bench vises centered about 32 inches apart. As the valve leaves the inspection station, it is clamped into an empty vise as it rotates from an "under" to a horizontal position on the endless conveyor.

In the succeeding operations, assemblers attach the cover, pack in lubricant, insert studs or cap screws, and attach several other parts to the valve without removing it from the line. The conveyor moves at about five feet per minute. This speed affords enough lapses of time for normal assembly of these parts. A variable speed drive is used, however, in order to compensate for any changes in valve models which might require more time to assemble.

As soon as these assembly operations are completed, several tests are performed. The valve is removed from the vise, then placed on an adjoining table where an operator adjusts it for optimum manual control tension. A special air clamp is used to hold the valve during this adjustment. Two discs of 3/8-inch steel plate, six inches in diameter, are mounted opposite each other in a vise-like arrangement. An air cylinder is attached to one disc which forces it toward the others, clamping the valve on its flange ends.

The question might arise here as to why the valve was not adjusted while it was in the vise on the slat conveyor. This may be explained as follows. The adjustment is an operation involving "feel". Therefore, until the correct tension is found the normal flow in the assembly line would be interrupted if the valves were to remain on the slat conveyor.

Belt to Monorail to Belt

The fracture, hydraulic seat and pneumatic seat tests are performed while the valves travel on a continuous powered belt at waist height. After the final test, the lubricating screw is inserted and the valve is hung on a monorail conveyor, which carries it through the automatic washing operation before painting. The painting is by hand spray gun while the units pass by at about 15 feet per minute. Swivel-hooks permit turning the valve around to spray all surfaces.

The 100-yard-long monorail delivers the painted valves to the shipping room where they are removed and laid on another belt. This method permits easy handling into skid bins or cartons. The larger valves are stacked one on the other in the bins and are later removed by lift truck to the shipping platform. The smaller sizes are packed individually in cartons for shipment.

Hoists for Large Valve Models

As shown in one of the photos, the assembly of the large valves is handled in a section which contains six jib hoists. These hoists have a capacity of from one to two tons, which is adequate for any valves assembled in this section.

Hoists of this capacity are also used in the paint booths. They are mounted on monorails which curve into the booths, and hence the valves can be approached from all sides during painting.

Skid load of valves being moved into highway truck by a fork lift truck.

We at Rockwell Manufacturing have found, through years of experience in valve production, that the use of proper handling equipment at each work station is vitally connected with maintaining the high quality production we demand. And the careful handling necessary in the movement of water, gas and oil valves can only be obtained by coordinating this equipment to give maximum output with minimum damage to the precision machined surfaces.

See the new "Where to Buy It Locally" Section, page 56

Serving America 40 Years

THIS MONTH Union Metal observes two score years of progressive service in American industrial life. These years have been marked by achievement through fidelity to an original ideal . . . the designing, engineering and production of quality steel products.

This translation of an ideal into tangible, useful products finds . . . tall, graceful poles lighting America's streets, making nighttime travel safer; sportsfield lighting bringing nighttime recreation and pleasure to millions; cargo booms loading and unloading ships speedily and safely; Monotube piles providing sound, dependable foundations for buildings and bridges; fluted architectural columns adding beauty to homes and public buildings; materials handling equipment speeding production in industrial plants . . . each contributing towards higher living and working standards.

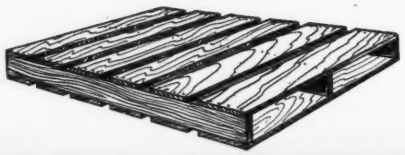
Today, Union Metal looks forward confidently to further development . . . and to serving America better.

Street Lighting Standards
Monotube Tapered Piles
Highway Lighting Poles
Power Distribution Poles
Materials Handling Equipment
Floodlighting Poles
Cargo Booms and Masts
Sign Standards
Hoobler Trailer Undercarriages
Architectural Columns

THE UNION METAL MANUFACTURING COMPANY

CANTON 5, OHIO

Craftsmen in Steel Fabrication

ON THE  PALLET

NEWS · VIEWS · TRENDS

WE'RE a year old! With this issue FLOW begins its second year of operation.

In retrospect, the first year has established several significant points — points that doubters and carpers brought up time and again when FLOW was just an idea.

The first point is that there is a place—an obvious need—for this magazine. The problem of expediting the flow of materials in plants, mills, warehouses and shops, has become increasingly acute. The successful solution to the problem spells the difference between profitable and unprofitable operation. And, as we move into a buyer's market for more intense competition for sales volume, the subject of material handling becomes more and more important.

Because FLOW is the first magazine to present the significant reasons for one company's success over another as far as its material handling problems are concerned, the magazine has filled a very important niche in American industry.

Our original subscribers are being asked for their renewals now and even at this writing the percentage of these folks who want to continue to receive FLOW is phenomenal for a new magazine. We're like a newly married couple—it's nice to know you're wanted. If there were no other indications of its filling a needed spot, these renewals for FLOW would be sufficient to prove the point. But there are many more.

The second important point is that gradually, but surely, during the course of the last year there has developed a consciousness of the existence of a material handling industry. The announcement of the first National Material Handling Exposition for January of next year is a reflection of the growth of the industry itself and a consciousness of all industry of the vital necessity for efficient material handling in modern business.

As an independent magazine with no axe to grind for any particular group, we have been able to report factually all the methods that are being used by business to reduce material handling costs. Obviously, one method may be right under one set of circumstances and not right for another. And the problems and their solutions can be, have been, and will continue to be presented factually, without bias, without outside pressure.

We would like to make a bok to those who have been so very encouraging during this first year—and a promise to them and to all others—that FLOW will continue to be "better than ever."

Happy birthday—to us!

On page 57 of this issue we are beginning a "Where to Buy It Locally" section because of the requests of quite a number of local representatives of nationally known companies who feel that they want to identify themselves and their services in their own trading areas. As time goes on, it is expected that this section will be of increasing usefulness to many harassed production managers with immediate equipment and servicing problems.

PURCHASE of an eight-acre tract in Bridgeport, Conn., containing eleven buildings with 230,000 square feet of floor space, and plans for eventual construction of other buildings to permit wholly integrated manufacturing operations at the new location, were announced today by The Bassick Company, a division of Stewart-Warner Corporation, Chicago. Walter F. Herold, executive vice-president, said that renovation and equipping of the plant, acquired from the government and formerly occupied by the Vought-Sikorsky division of United Aircraft Corporation, would begin at once, with occupancy late this year. The Bassick Company manufactures industrial and general lines of casters, chair-tilting devices, automotive hardware and powdered metal parts.

Purchase, renovation and machinery installation in the new plant, plus new construction at the site to provide a total of 400,000 square feet of manufacturing space, will represent capital investment of close to $2,500,000, Herold said.

STANDARDIZATION of pallet sizes and types for unit handling of food industry commodities was discussed by representatives of the wholesale grocery industry and material handling equipment manufacturers from all over the nation and U. S. Department of Commerce officials, August 15, in Washington, D. C.

Sponsored by the National Bureau of Standards, the conference was called to consider material handling problems of the food industry, particularly as related to cross-country shipping. The meeting was held in the Commerce Department building.

GENERAL BOX CO. is putting the finishing touches on one of the country's largest and most completely equipped laboratories for testing and design of shipping containers. To better serve the needs of industry, this new laboratory will be centrally located in downtown Chicago, adjacent to the executive offices. It will occupy 10,000 square feet of floor space in a modern fireproof building. The announcement was made by Vice-President N. A. Fowler.

(Turn to page 59)

REG. U. S. PAT. OFF.

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The most efficient shipping container is one that has all excess poundage trimmed off and is stronger. Acme Steelstrap builds up strength and makes containers better able to withstand the hazards of transportation.

Acme Steelstrap lowers shipping costs because: (1) original container costs less due to reduced weight of raw material and resultant manufacturers labor, (2) lighter containers mean less dead freight weight and, (3) claims for damage and pilferage are fewer.

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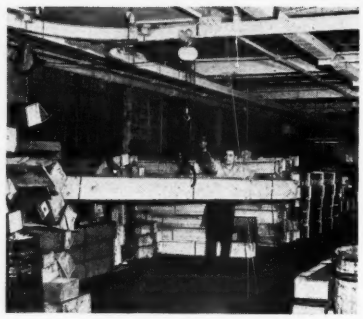
NEW YORK 7 ATLANTA CHICAGO 8 LOS ANGELES 11

ACME STEEL COMPANY

ACME STEEL CO.
CHICAGO



Hoisting boxed tubing with special hook. Note monorail spans entire storage area.

This company proves once more that size alone does not determine the productivity of a plant. Handling devices used in this plant of 80 workers explain the impressive production.

By E. R. CLAPPER
Engineer
Methods Engineering Council
Wilkinsburg, Pa.

TWO main problems confront manufacturers large and small: 1. Material flow through the plant; 2. Storage of material. The Lawson Mfg. Co., Pittsburgh, Pa., had both of these problems. It produces hot water heaters in quantity (a specialty). The company does not manufacture the tanks, which are the largest part of the entire assembly.

To handle the material in the extensive storage area required for thousands of water tanks, an analysis was first made to determine which areas in the 400-foot building were most adaptable for storage and manufacturing, respectively.

The rear of the building has a spur running alongside the loading and unloading platform, so this portion was ideal for receiving and shipping. However, most of the shipments of the finished water heaters are L.C.L. An entrance at the opposite end of the long narrow building, facing the highway, was decided upon as the most suitable shipping point for these items.

The portion of the plant extending from about halfway toward the railroad siding end is allotted for tank storage. The remainder of the floor is devoted for the most part to processing and assembly.

Diversified Handling of Coils

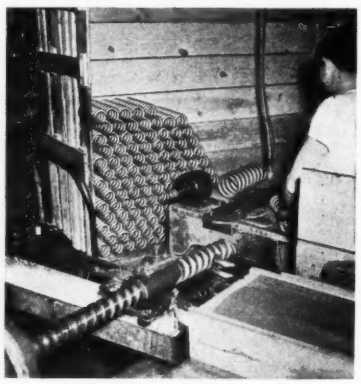
The coils and water jackets are processed in a part adjacent to the main assembly section. The copper coils are received as straight tubing, cut to the approximate lengths determined by the diameter and pitch of the finished coils. The tubing is brought from the receiving dock to the tube storage area by hand truck. A monorail hoist spans the aisle and extends on either of its sides.

When the tubing arrives it is stored across the aisle from the processing department, by the sling-and-hoist method, as shown in one of the photos. By the same method, the tubing is fed into the tube bending machine. A long table holds a supply of the tubing which is run through the bender. The tubing emerges as a heater coil on the opposite side. The ends are trimmed to correct length, and the coils are stored in a special four-wheel truck which has a partition extending lengthwise through the center.

The ends of the truck are enclosed to form two separate sides, by use of the partition, for temporary storage and movement of the coils to the baffle installation. The coils are laid on their sides, one on top the other with the partition stabilizing the load on each side of the truck (see photo).

When the baffles are inserted and the coils are fitted one within the other, they are brazed in place. This operation is performed on a rotary steel fixture which holds five coils simultaneously, the loading position being at waist height. The coils are rotated against pre-heating and final brazing torches successively mounted at the circumference of the fixture. V-ways welded to the circular steel frame hold the coils, while the entire unit is mounted on a tubular base which rests on a steel pedestal.

After brazing the two coils together, the operator cools the unit in a water tank. The unit is then laid in a metal container having two sides and a bottom. The containers rest on the upper deck of a gravity roller system, and are



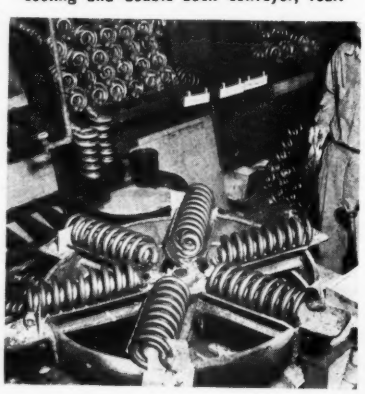
Hand truck holding coils of two sizes with partition separating the stacks.

sent to the assembly section where the outer sheet metal jackets, top, bottom, and insulation are added around the coils.

Before the coils and jackets are united, an air pressure test is per-

(Turn to page 54)

Six-station brazing setup showing tank for cooling and double-deck conveyor, rear.



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➤➤➤ "SMALL PLANT INSTALLATIONS" is the monthly department in FLOW written especially for the small shop that desires the saving and profit that follow stream-lined production, assembly, storage, and shipping. If your plant is small, you can profit from this data regularly. Just *subscribe to FLOW*.

➤➤➤ "OFF THE SHIPPING PLATFORM" is one of the most interesting departments in *Flow*, as right here is one of the big leaks along the line of production movement that are so seldom plugged. FLOW points out those leaks to you, and tells how to stop them.

➤➤➤ "NEWS—VIEWS—TRENDS" helps your perspective by digesting past, present, and future into an easily absorbed capsule of material which goes to nourish the various parts of your productive enterprise. It keeps your thinking up-to-date regarding mass production methods. If this were the only department in FLOW you read, you would still know what was going on—and you get it every month, when you *subscribe to FLOW*.

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Street address _____

City _____ Zone _____ State _____

Cold Facts for

DEEPFREEZE dealers around th cou long for delivery of these home freez nized assembly line ups produ ion 2. Devices are installed for effi ient s working heights facilitate asse bly. obtained—up to and inclu ing

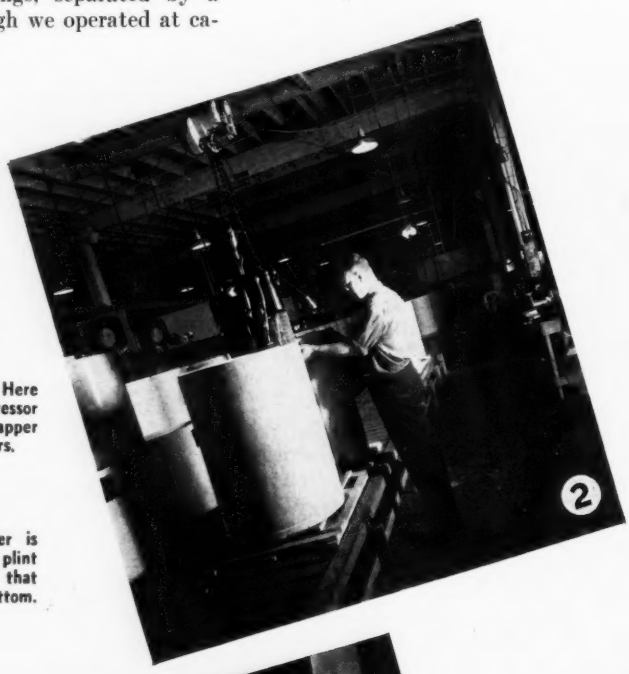
By J. M. BAKER, Factory
DEEPFREE E Divisi
Motor Produc Corpo
North Chic go, Illin

From main line double free ers are to parallel conv ors for

WE at Deepfreeze feel that we have come a long way within the last year—a belief which FLOW editors share with us. Hence this article.

Comprehensive Planning Job

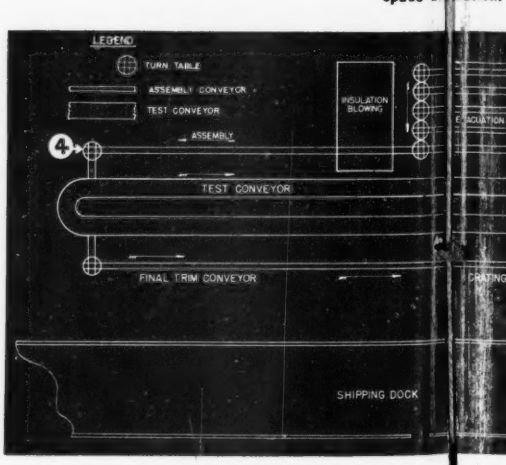
While the assembly of home freezers is its subject, it may be well to preface this discussion with some general background information. A little more than a year ago, this plant consisted of two individual buildings, separated by a street. Though we operated at capacity, production was low. Lack of a continuous conveying system prevented efficient movement of the units from station to station as well as efficient space utilization. This meant much extra handling. The crux of the difficulty was the lack of means of connecting the two separated plants. We fabricated parts on one side of the street, assembled on the other. Solution: we succeeded in having the street condemned and built an L-shaped connecting section. The space of



Hoist does lifting. Here it is lowering compressor on double unit. Wrapper protects cylinders.

Start: cold cylinder is slipped over cork plint on baseboard. Note that board is on crate bottom.

Flow diagram of DEEPFREEZE assembly ne illust space uti zation.



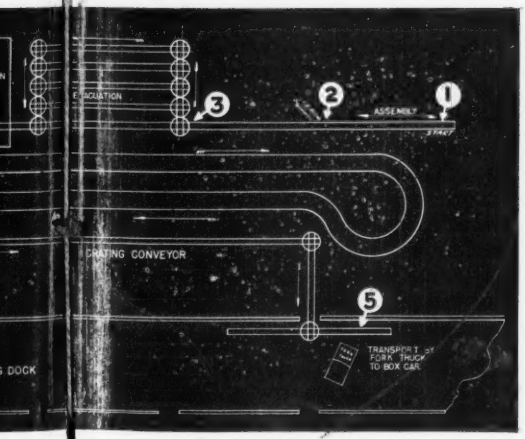
...or Fast Delivery

...und th country shouldn't have to wait home freezers, because: 1. A mecha- produ ion several hundred per cent. r effi ient space utilization. 3. Proper assem bly. 4. Control of production is inclu ing packing and shipping!

. BAKER, Factory Manager
EEPFREEZE Division
r Product Corporation
orth Chic go, Illinois

uble free ers are shunted via turntables llel conve ors for evacuation.

ssembly ne illustrates straightline flow, excellent space uti ization.



30,000 square feet thus gained came in handy for a warehouse used for freezer components. The building is for the most part of one-floor construction and comprises about 190,000 square feet. The mechanized conveying system that was installed was part of the over-all planning job.

In our present layout the sheet metal parts for the home freezers advance from fabrication to the start of a 2,200 foot long overhead chain conveyor. It carries the components to several preparatory stations, then to the painting and baking departments, all of which have been installed over the concrete warehouse section in the rear of the plant. The space-saving feature of locating these departments "up stairs" was made possible largely by use of the overhead chain conveyor. It carries the pieces from the ground-floor to the upper level, conveys them through the processing operations, and then, without any handling along the entire line, returns the finished parts to the start of the ground-

Oval section of test line, with castered truck carriers, trolley duct. Arrow shows turn table.

Boxed, stencilled, marked, unit is rolled from end point on truck forks, ready for shipment.

Clever wrapping on special table: cylinder is practically self-wrapped when put in concave fixture.

floor assembly line in the west section of the plant. This brief summary indicates part of the production planning job that had to be done. The material flow described in the paragraphs that follow can be conveniently observed in the diagram reproduced on these pages.

Low-Cost Production Requires Low-Cost Handling

The Deepfreeze Division of our company specializes exclusively in home food freezers. The two models made consist of a single and double unit. Both move over the same line and both receive the same parts, with certain minor exceptions.

The start of the assembly is close to the warehouse in which the base boards for the freezers are placed on a gravity roller conveyor. In a straight line about 50 feet beyond this point, the first assembly station is located. The base boards arrive here with the cork plints already attached. This is the insulation at the bottom of the cylindrical freezer shell. The single unit, incidentally, consists of one cylindrical container, the double unit of two of these which are arranged side by side on a larger base board. This explains why the handling of both is to a large extent the same.

At the first station, the harness and the "cold" cylinder (inside shell) are added. At this point, a feature can be observed that pertains to the very last operation performed at the end of the line—packing. For the base board rests on an unpainted wooden frame which rides the rollers—the bottom of the shipping box.

Planned packing, we feel, is an essential part of efficient, low-cost handling. Planned packing more than avoids extra handling of the finished units at the end of the line. For example, we ask our wood parts supplier to furnish the base boards attached to the shipping frame, thus eliminating this operation at our plant. Convenience to the customer is another advantage. He need merely knock off the side walls and then remove the four bolts by which the base board is fastened to the crate bottom. The latter also helps protect the unit during the assembly, serving as a "shock absorber" in any bumping or scraping that may occur. And the ease of boxing the finished unit at the end of the line, without any lifting, is another important advantage.

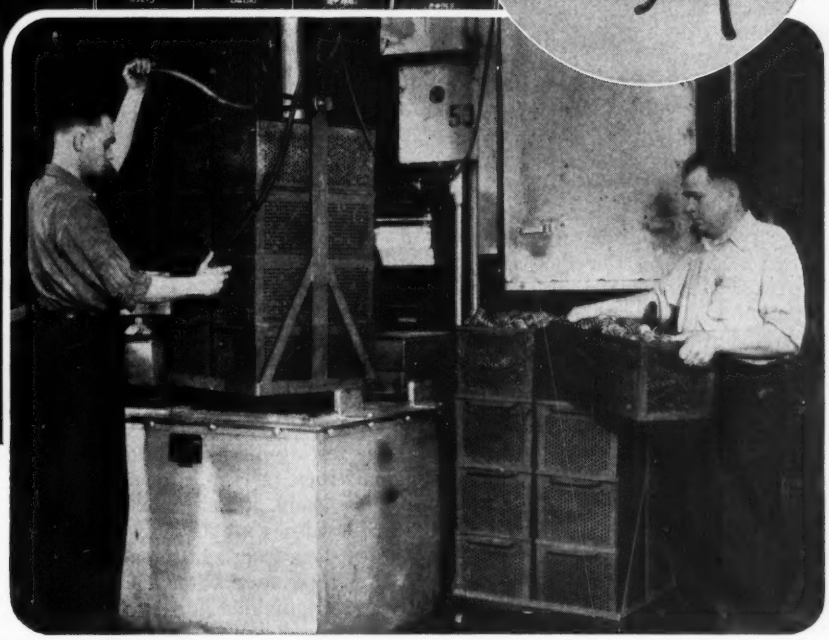
Now equipped with the harness and the cold cylinder, the freezer advances from the gravity roller section to a powered slat conveyor, which has variable speed control. This permits us to pace the line according to the production schedule or the amount of material available. On this line such items as expansion valves are assembled and the sealer is applied. These and other small parts are supplied to the operators by use of tables placed parallel to the line on one side; larger parts, like the outer cylinder, are stored within convenient reach on its other side.

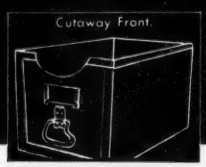
It may be of interest to mention a special method we developed for wrapping the outer cylinder at this point. A brown paper wrapper is applied to it just prior to the assembly in order to protect the finish. The surface of the special wrapping table is installed at a diagonal angle (see photo), which facilitates handling to and from it. Another feature is the concave section in the center, which is flanked by a leaf on each side. To wrap a cylinder, the operator pulls a length of paper from the adjacent roll across the table, which provides a sheet of the correct length. He then places the cylinder (over the paper) into the concave holding fixture. As the sheet is depressed, it at the same time "wraps itself" around the major portion of the shell. A strip of gummed paper is then applied to the left and right ends of the wrapper, which are smoothed around the unit. The operator now picks up the wrapped cylinder and places it on the assembly. Thus he need not "roll" the unit on a flat surface, nor measure the length of the paper. As a result, he can without effort wrap these parts and dispose of them as fast as the units move past his station.

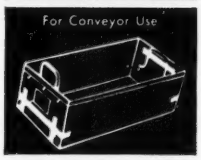
The assembly on the base boards is done with air drivers. Where the relatively heavy compressors are dropped into the units, the job is safely and speedily performed by use of an electrically operated jib hoist. A point regarding positioning of the units along the path of travel might be mentioned. At the start of the line, where most of the operations are performed on the base boards, the conveyor is at waist height in order to minimize stooping on the part of operators. As the line advances, and operations are increasingly performed on the upper part of the cylinder (about 30 inches high), the line dips to a lower level, thus keeping the work at optimum working height throughout.

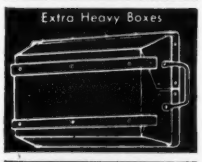
Rectangular Space Utilization

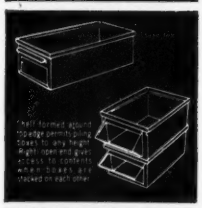
The slat conveyor is about 200 feet long, and beyond it the units

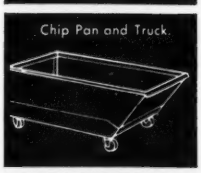


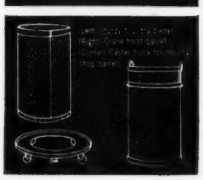












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move onto a roller conveyor section. This is the evacuation or dehydrating station, where moisture is removed from the harness and the cold cylinder. This requires about 15 minutes, and hence a temporary storage area had to be provided which would permit shunting the units off the line and then back on again, with minimum handling, upon completion of the operation.

This was accomplished by installing in the space adjoining the right-hand side of the main line five parallel roller conveyor sections, each about 75 feet long. The space between any and all of these parallel sections is readily bridged by roller turntable sections, as shown in one of the photos. Suppose a double freezer unit, weighing about 400 pounds, has just arrived at the transfer point on the main line. The turntable in the line is simply pivoted, and it now connects with the laterally turned turntable in the adjoining line. With a push of the hand, the 400-pound units can thus be readily transferred from one parallel gravity roller conveyor to the other. The same arrangement of turntables is also provided at the opposite end of the 75-foot sections, where the units are shunted back to the main line upon completion of the dehydrating operation.

A few feet beyond this exit point, the insulation material is added between the two cylinders mechanically, which avoids hand packing. As the freezers arrive at this station, they are positioned under the filling machine which operates pneumatically. It is fed from a hopper installed above the line. Since the insulation material (balsa wood wool) is blown down from above under considerable pressure, a provision must be made for the excess air to escape as it packs the material tightly in place. (Otherwise the updraft of the escaping air pressure would blow part of the light insulation wool from between the two cylinders.) For this purpose, a light-gauge metal cylinder is first prepositioned between the inner and outer freezer walls. When in position, it is within 1/8 of an inch of the outer cylinder, and it is equipped with air vents around its entire circumference at the bottom. Consequently, as the down draft blows the material in place, the air pressure is dissipated via the vents through the space created between the inserted cylinder and the outer shell of the freezer unit. The thin-gauge cylinder is then withdrawn, without disturbing the packed insulation wool. This operation is performed in a matter of seconds.

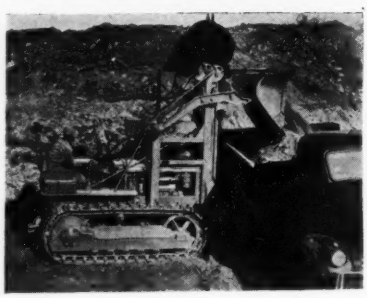
Next, the sealer ring is attached to the top, and the freezer is then pushed to the final assembly station where the remaining parts are added and the wiring is completed. At the end of this roller conveyor section, about 100 feet long, the units are ready for testing.

Here the nearly completed freezers are routed once more at right angles from the main assembly conveyor—this time to the testing line. As in the dehydrating department, the transfer here is likewise accomplished smoothly by means of gravity roller turntables (see flow sheet).

The testing line consists of individual truck carriers, propelled by a floor chain, which move in a nearly-oval circuit that is about 250 feet long from end to end. The beds of these trucks consist of rollers and are divided into two equal parts. Installed between them is the vertical frame to the top of which the electric testing controls are attached. The two roller conveyor beds on the trucks are installed on a welded structure of channels and I-beam sections. Each truck accommodates two double freezers (one on each side) or four single units. A trolley duct outlet is above the test line, providing a moving source of power as the units are slowly propelled during the test period requiring four hours. Curved lengths of channel iron bolted to the floor at either end of the oval circuit serve as guides for the truck wheels rounding the bends; and strips of sheet metal laid over the concrete floor prevent the wheels from grooving the cement surface on the straight sections of the oval.

Upon completion of the test, the units have returned to the starting point, but on the line opposite to that on which they entered. They are now routed to the final trim line over another turntable section. Here the gas is pumped back into the receiver, plates and tie rods are attached, and decorative chrome trim is applied. As a safeguard during shipping, a band of steel strap is secured over the relatively heavy compressor. The strap is threaded through the base of the shipping crate on which the freezer has traveled throughout the assembly. After final cleaning, the completed freezers advance to packing.

MINING CLAY—This Diesel-powered tractor, equipped with a heavy-duty mine bucket, is mining clay used in the manufacture of brick and tile. The mining site is near Morrison,



Colo. The tractor handles 35 cubic yards per hour, working eight hours a day. It mines four clay veins in adjoining beds, moving from one vein to another on each truck load, thus mixing the material at the same time. —*Courtesy, Caterpillar-Tractor Co.*

Speedy Packing and Shipping

The packing station is simply another point along the same gravity roller conveyor. Two operators, one stationed on each side of the line, first nail the plywood side walls to the base of the crate. At the adjacent station, another operator nails on the end walls and the top, followed by stencilling and marking of the completed shipping case. Shock strips and necessary padding have previously been tacked to the inside of the prefabricated box parts. Note, too, that stencilling at this point makes it unnecessary to perform this operation later in the shipping room, where extra handling sometimes results in delays.

The boxed unit, ready for shipping, has now arrived at the end of a straight roller conveyor section that started at the final trim line. From this point the line continues at right angles to the shipping department, and at the junction an-

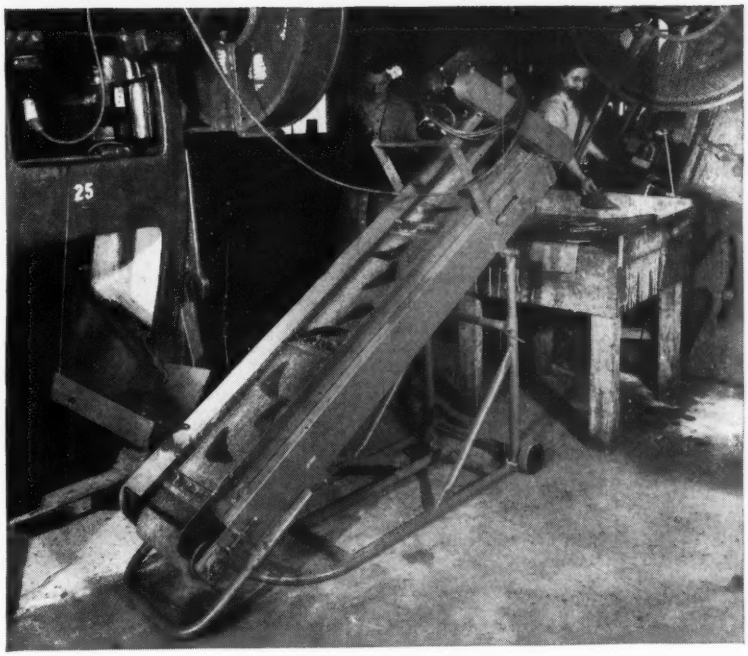
other turntable transfers the units from one line to the other.

Today the boxed freezers are usually loaded into outgoing carriers as soon as they arrive at the end of the line. While the unit is still on the conveyor, a fork truck operator will run up to the end point, elevate the forks just below the bottom of the rollers, and the box is then pushed onto the forks for movement to the outbound freight car or truck.

The shipping department is paralleled on one side by a double set of railroad tracks. A standard freight car is usually loaded with about 40 double freezers—a job one fork truck operator can perform in a relatively short time. Truck loading is done from the southwest end of the same floor. Thus, with our present backlog of orders, the freezers are frequently loaded from the end of the production line. However, storage space for later use is amply provided in the sizable shipping area. When this space is used in the future, the present gravity roller line will probably be extended for easy routing of the boxed freezers to the several locations.

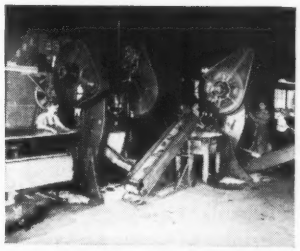
This completes the description of the handling on the assembly line, which was also installed within the last year, exclusive of planning. Prior to the present expansion program, the assembly of the units was handled on individual carriers which were pushed from one department to the next, with no proper sequence of operations.

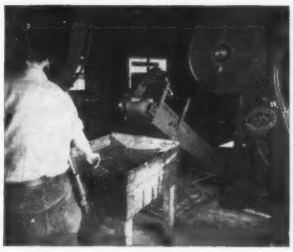
With our present mechanized system, on the other hand, operations follow in their proper order in accordance with progressive assembly line methods. Whereas previously production was left pretty much to the individual operator working on his unit separated from all the others, the flow is now timed to produce a certain number of freezers in a given period (subject to availability of material). Operators no longer push individual carriers about, but stay at their work stations. And with all handling mechanized, workers are able to concentrate their efforts on the essential job of producing the freezers. All this explains why deep-freeze production has been increased by several hundred per cent.



BETWEEN MACHINES **PRODUCTION FLOW-WAY**

THE RAPIDS-STANDARD *Press-Veyor*





Keep small parts flowing steadily between machines . . . eliminate stock handling men . . . reduce worker fatigue . . . efficiently mechanize your entire production line . . . with the **Rapids-Standard Press-Veyor.**

Readily portable, the Press-Veyor is a power driven, endless belt conveyor that can be used anywhere in the plant. Where small parts and scrap are otherwise carried by hand, the **Press-Veyor** "Production Flow-Way" reduces accident hazard through better shop housecleaning . . . carries production along smoothly. Fatiguing, time-consuming, "shovel and lift" methods are eliminated.

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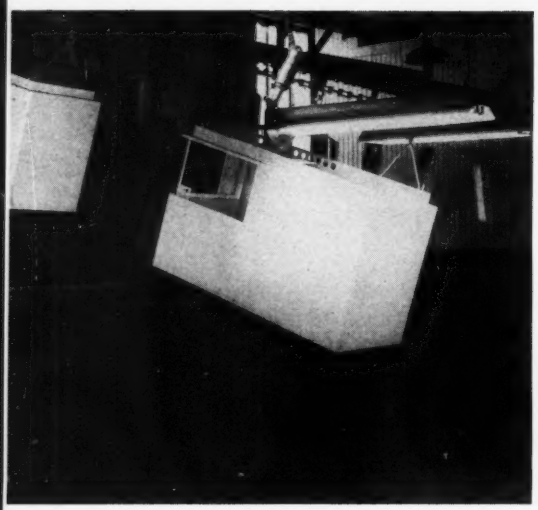


Figure 1—Shell of freezer unit, leaving spray booth, is palletized for packing before assembly.

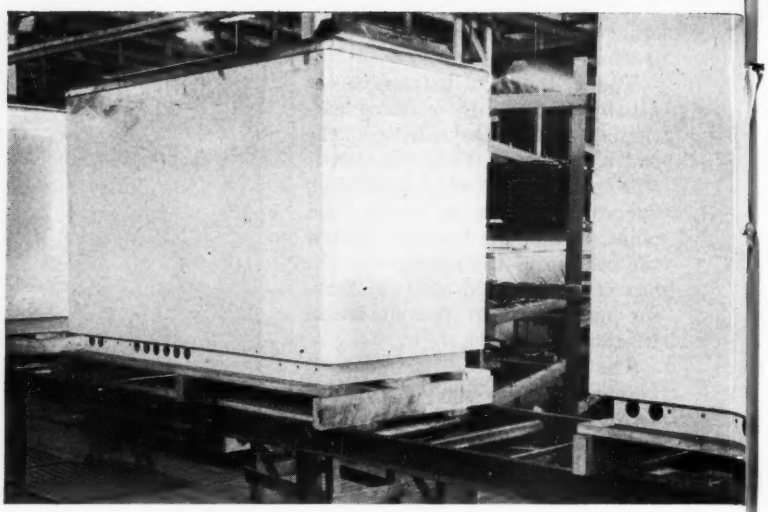


Figure 2—Freezer units move through assembly on pallets that form bottoms of shipping crates.

PACK AS YOU GO

"Planning for packing" at this plant has eliminated congestion, speeding packing, avoided excess handling of materials.

By S. E. STRAND

Packaging Engineer
The Brunswick-Balke-Collender Co.
Muskegon, Michigan

WITH the cessation of hostilities, The Brunswick-Balke-Collender Co., known chiefly as the world's largest manufacturer of bowling and billiard equipment, began production of commercial refrigerators and frozen food units. A feature of this line is the provision made for packing these units—a feature that holds packing time to a minimum. As a matter of fact, the refrigerators and freezers are already prepared for packing as soon as they start though the assembly operations. You might say that the crating is planned as part of the over-all production operation.

I might mention in passing that our company's interest in the manufacture of commercial refrigeration units is not something new. We had been manufacturing beverage and food cooling units before the war. During the war, Brunswick engineers redesigned these units and originated the frozen food storage cabinet. Another model was designed especially for export trade.

Planned Packing Operation

Figure 1 shows the chain conveyor on which the outside shells and smaller assemblies are carried through the Bonderizing operation. A similar conveyor then moves these parts through the spray booths. At the end of this second line, the shell is deposited by means of an electric hoist on a 32" x 63" shipping pallet. Six bolts are used to attach the shell to the pallet—

Figure 3—At endpoint, shock strips are applied —and soon freezer will be completely crated.

Figure 4—The prefabricated shipping container is now slipped over, then nailed to the pallet.

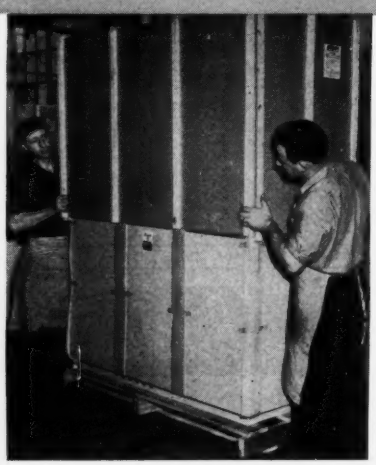
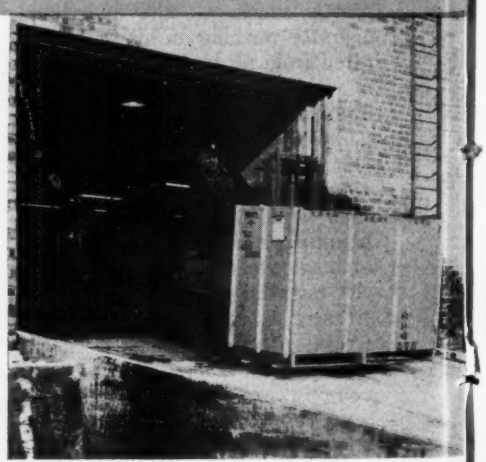


Figure 5—And—presto!—unit is completely packed and prepared for fork truck handling.



and the latter is, of course, the foundation of the crate that will carry the unit through subsequent warehousing, shipping and delivery operations. See Figure 2.

A glance at Figure 2 reveals certain features of the pallet which were designed both for assembly as well as for shipping purposes. Three boards form the upper deck, while only two are used for the lower deck, which holds the weight to a minimum. Note also that the two boards on the bottom are spaced so that they fit between the roller conveyor rails, preventing the unit from sliding off as it moves on the line through numerous assembly stations. The weight of this shipping pallet is about 42 pounds.

The assembly operations begin immediately adjacent to the point where the shell is bolted to the pallet. The inside tank assembly is lowered by hoist into the outer shell, the compressor is added, followed by miscellaneous small parts. Throughout, the conveyor line positions the units at the required working height at the various stations.

Powered belt lines, or booster sections, are installed along the path of travel to elevate the units to higher levels wherever necessary; or they are returned to lower working levels by means of gravity roller sections. This line continues through various assembly stations, then to final inspection and packing.

At one point, incidentally, the units are pushed from a floor-level section onto caster-mounted dollies for movement to the various test set-ups. After testing, the completed refrigerators are returned from the dollies to the line. A part of this floor-level conveyor section, the "final trim" station, is shown in Figure 3.

Here the units, moving along on the shipping pallets, pass the final inspection station and then advance to the end point. The shipping pallet now meets the rest of the crate or wrapper.

As can be see from Figure 4, the "bumper" or shock strips are first applied. Next, the prefabricated shook or shipping container is slipped over the finished unit—an operation that requires a minute or two. The shook is then nailed to the pallet—and the unit is com-

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IS EASIER AND MORE PROFITABLE WITH . . .

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LOW MAINTENANCE

Production men know from experience that operating costs go up unless materials handling is carefully watched. That's why so many turn to Farquhar for long life and low maintenance conveyors that mean the easier handling of all types of materials at more profit.

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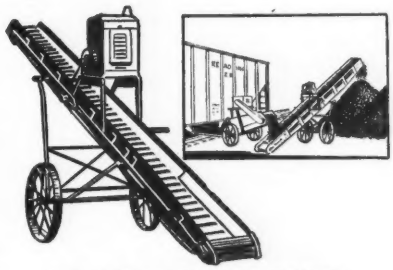
The Farquhar Ace, Model 334-3, is a sturdy, time-saver built in ten sizes for handling coal and coke. The Model 334-T is a general utility conveyor for handling coal, sand, gravel, etc. The Portable Car Unloader speeds unloading hopper bottom cars.

ASK FOR DESCRIPTION BULLETINS 334-3, 334-T, 341-342

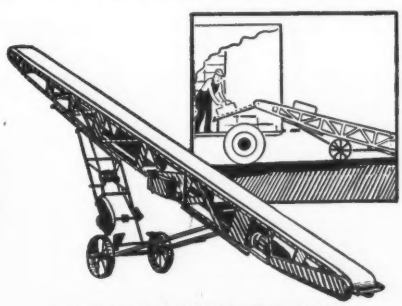


THE ACE and CAR UNLOADER

FOR PACKAGE HANDLING

Model 391 and Model 432, Farquhar Freight Conveyors, have unlimited uses in all industries. Will carry bags, boxes, cases, crates, etc., at speeds to suit requirements and are designed for horizontal or elevating service.

ASK FOR BULLETINS 391 and 432



THE FEATHERWEIGHT FREIGHT

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pletely packed, as shown.

It is now ready to be picked up and moved by fork truck (Figure 5). The units are thus transported with dispatch to storage or directly into outbound vehicles. Should the receiver have further use for the shipping pallet, it is at his disposal.

Our present method of "planning for packing" has added considerable speed to the operations at the end of the line. It has eliminated congestion that was formerly caused by units waiting to be crated. It has avoided excess handling of packing materials. And it has enable us to divert more manhours to productive efforts.

HOOVER'S AUTOMATIC SYSTEM

(Continued from page 16)

a soundproof cabinet which will accommodate approximately 64 motors. Two levels are built into this enclosure; one on top for motors being tested, and one below for returning empty motor trays. The handling trays upon which the motors are placed run on two grooved tracks, which act as guides for the wheels mounted on the underside of the trays. The top-level tracks slant downward away from the loading position, while the bottom tracks (located about 12 inches beneath) slant toward the loading station. After assembly, an operator places two motors on an empty tray which he moves to the top tracks. The tracks on which the loaded motor boxes are placed are electric bus bars and feed current to the motors through the wheels of the boxes. Heat, air (from the suction fan), and noise are all dissipated in the cabinet.

When this testing is finished, the motors have progressed down the slanting tracks by gravity, pushing the other motors on trays ahead. Doors located at each end are raised vertically to load and unload the testing cabinet. This cabinet is particularly effective, and is economically constructed of several thicknesses of soundproofing board. Since the fall from one end of the cabinet to the other is only a few inches, the loading and unloading points remain at waist height, affording easy access at both ends of the chamber.

Sales Depend on Appearance

The appearance of an electric cleaner can only be maintained by providing handling media which will permit even flow and minimum marring. During the final assembly, the cleaners are handled on tables covered with soft carpeting, which prevents any damage to the highly polished surfaces. Here, the motors are assembled to the main housing while the wheels, brushes, etc., are added subsequently.

At this point the cleaners, now completely assembled except for bags and handles, are put through a series of operating tests on a 30-inch width of typical home carpeting. The cleaners are attached at various fixed positions on the carpeted table. This provides the same load encountered in home service and warms up the cleaners for subsequent final tests and adjustments.

After the final check is made, the assemblies are ready to be packed in the familiar carton. The cleaners move from the final inspection station on a table, which has a narrow belt running in a groove in the center of it. One-by-three-inch rubber tabs are glued to this belt on six-inch centers, extending about 1/16 inch above the belt itself. The rear wheels of the cleaner catch on these tabs, and it is thus moved to the packer. See further details on this setup in the "Mechanically Speaking" section.

The attachments which are manufactured in another part of the plant arrive at this point to be packed along with the cleaner. Circling on a powered monorail conveyor, these accessories are packed at this time.

To package the cleaners three to a carton, a container was developed to hold this quantity already boxed, plus the handles which are packed alongside in the same carton. Packing these three containers into the carton was made much easier by providing the following setup: Two sections of gravity roller, each about 18 inches wide, are mounted one on top the other channel-to-channel at a 45-degree angle from the floor. On the floor end of these, small ball-bearing wheels attached to a common axle and spaced on the wheel diameter centers, are affixed. (See photos.) The large cartons are set three at a time on these sections, and three boxed cleaners are slid into each of them. Without lifting the large cartons are then rolled over an adjoining section of gravity line to a stapling machine, which fastens the cover.

This description is another example of mass production aided by efficient handling devices. It also is an example of how mechanical handling contributes to lowered production costs, speeding the assembly of a household appliance that has come to be a necessity in millions of homes.

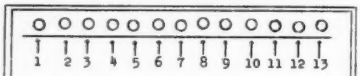
CONVEYOR SYSTEM STATION LIST

This is Station No.____

TO DISPATCH A CONVEYOR BOX TO ITS DESTINATION:

Place box on track with pin rack forward.

Insert deflector pin in proper hole in accordance to the following station list.



STATION NUMBERS

1--SUB- & FINAL ASSEMBLY DEP'TS.
2--RECEIVING DEPT.
3--
4--PLATING DEP'T.
5--POLISHING--Machine Dep't.
6--ORDNANCE--Third Floor
7--MACHINE DEP'T.--Finished Castings
8--PUNCH PRESS DEP'T.
9--AUTOMATICS DEP'T.
10--MOTOR MACHINE DEP'T.
11--ORDNANCE--First Floor
12--INSPECTION DEP'T.
13--DIE CASTING DEP'T.

To dispatch to Factory Stores. DO NOT PIN BOX.

SEND ALL EXTRA PINS TO STORES.

USE SHORT PINS IN HIGH BOXES
USE LONG PINS IN LOW BOXES.

Conveyor station list which is located at each loading section in the line.

FIRST NATIONAL MATERIAL HANDLING EXPOSITION

Last month's article on the material handling industry's first National Exposition brought considerable response from readers and exhibitors alike. (September, page 19.)

A number of companies wrote in asking for the name of the exposition management. Here it is: Clapp and Poliak, Inc., 37 Wall Street, New York 5, N. Y. Requests for space should be sent to this firm.

A NEW NOTE

(Continued from page 20)

place over and above the lumber package horizontal with the top of the load. Each layer of boards will be scraped onto a roller table powered to bring each board up to the operator. When the last board of the layer is removed a limit switch starts another scraping process for the stickers which are spilled into removable skids. When the last sticker in the layer leaves the course the entire load automatically rises and is ready for the next scraping process. An electric hoist on an I-beam trolley removes the empty trucks and stickers to a storage track. The waste from the cut-off saws drops directly into intermediate conveyors feeding a long under-the-floor conveyor to a wood shredder and from there into a dust collecting system.

Models Aid Layout Interpretation

Operation of the lumber handling system described above will be under the direction of Assistant Works Manager Irving O. Vaaler, in charge of all woodworking and final assembly divisions, and Woodworking Superintendent Leonard Cumming. These men and members of their departments worked in conjunction with Assistant Works Manager Ralph Wilson and Plant Layout Engineer George Petech in the development of the new system.

They realized, however, that in the presentation of any new system of material handling, layout drawings, while necessary and helpful, are often inadequate to fully demonstrate its actual operation and that other forms of description must be employed.

Therefore, at Wurlizter the layout drawings were translated into three dimensional wood models. These models, shown in an accompanying photo, are working replicas of the real thing. Better than drawings or words they proved that the proposed system was not only feasible but practical and economical.

Layout Analysis Pays Dividends

Thus at Wurlitzer, painstaking material handling and layout analysis has paid dividends in the form of a new plant layout with the following principal achievements and benefits:

1. Through coordination of related activities, space has been provided for manufacture of a new product without sacrifice of production capacity required for the original product and without over-expansion of plant facilities.
2. Through relocation of the phonograph production line a one-floor, one-direction flow of materials has been obtained eliminating some previous backtracking and between-floor movement of the phonograph cabinet unit.
3. Through development of a unique system for the mechanical handling of lumber the flow of lumber feeding the corestock and veneer departments has been increased and manual labor costs reduced.

THE MAKERS OF *Motorola* RADIOS FIND THIS NEW

ALL STEEL CONVEYOR

Cuts Costs AS IT *Speeds Production*

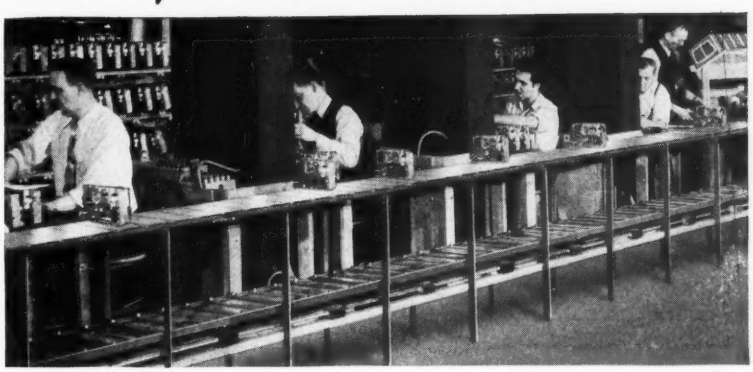
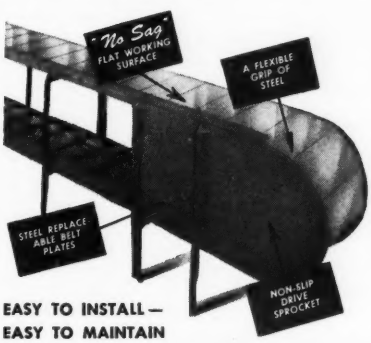


Photo Courtesy Galvin Mfg. Corp.



EASY TO INSTALL—
EASY TO MAINTAIN

• The Galvin Mfg. Corporation originally ordered Steel Parts Conveyors for use in their cafeteria. When engineers saw how smooth running, silent and efficient this new steel belt conveyor was, they moved it onto the production lines where its no-sag flat working surface and trouble-free operation has speeded assembly and inspection. Galvin is not alone in their enthusiasm for this new all steel conveyor. The list of satisfied users reads like a Blue Book of American Industry. Find out how the new Steel Parts Conveyor can speed your materials handling job.

Mail This Coupon Today

For detailed descriptive booklet. Send to:

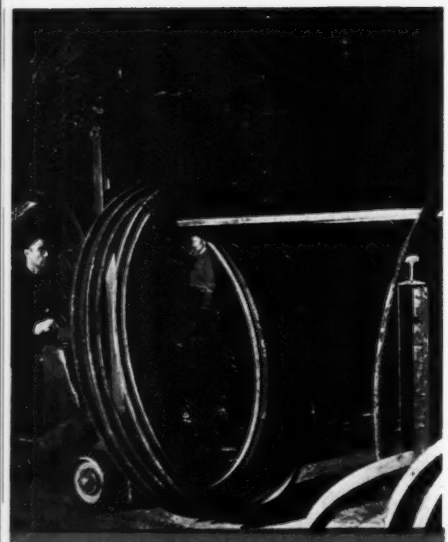
STEEL-PARTS MANUFACTURING CO. • Division of Blackstone Manufacturing Co.

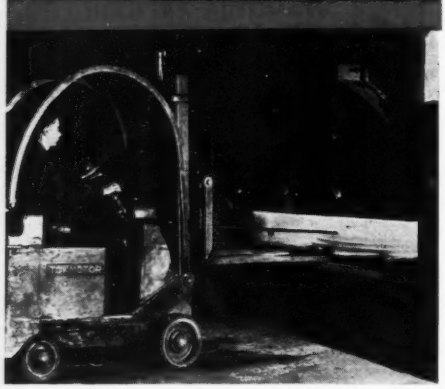
214 S. MORGAN STREET, CHICAGO 7

Name..... Position.....

Firm..... Address.....

City..... State.....





These steel rings produced at American Welding & Mfg. Co. come . . .

HOT, HEAVY and Fast

Continued heats of 1200°F are a typical production requirement for these unwieldy rings weighing 800 pounds and measuring up to seven feet in diameter. This means FAST handling—a difficult job done with ease by fork trucks.

ONE type of steel ring produced at this Warren, Ohio plant is made from chromium-molybdenum alloy. Formed and machined to close tolerances, it must be perfectly balanced and provided with multiple bearing and close fitting surfaces. During the forming process, the huge rings must be handled while almost white hot in a series of operations which include sizing or expanding and flattening. The problem factor involved is *speed.* If it takes much more than one minute to complete the entire handling process from furnace, to sizer or expander, to flattening press, to inspection pile, the ring has to be returned to the furnace for reheating.

Fork trucks are used to do the biggest part of the job. The 800-pound rings, which are seven feet in diameter, are placed in one of the furnaces for heating to 1200° Fahrenheit. When sufficiently heated, the glowing rings are pulled out by the truck forks and one or two men with grappling hooks. Fast handling whisks it to the sizer or expander, which stretches it to proper diameter. The distance covered varies from 20 to 50 feet, depending upon location of the fur-

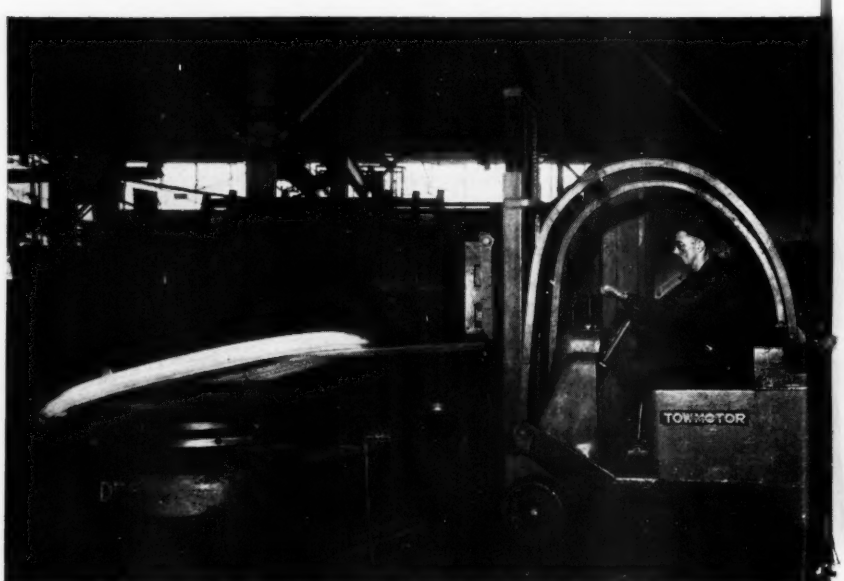
Fork truck picks up load of rings after flash welding, carries them to 1200° heating furnace, photo at top.

●

Grappling hook used to help fork truck pull heated ring for fast transfer and positioning on sizer, second photo from top.

●

Letting hot ring "hook" on sizer, truck lowers, backs away, allowing ring to settle in position, view at right.



nace being discharged.

Then, still red hot, the ring is forked from the sizer, carried 30 feet to the 500-ton hydraulic flattening press and set carefully in place. This requires some skillful maneuvering, however, for the forks of the truck must enter the narrow gap between the flattening dies from the side in order to position the ring exactly.

After flattening, the still glowing ring is removed from the die by the fork truck and carried to the inspection pile for cooling and inspection against hardness specifications, preparatory to machining.

Thus the demands for *fast* handling are adequately met by nimble trucks which transfer the glowing rings between stations in accordance with exacting production requirements.

ADEQUATE SHIPPING CONTAINERS FOR TODAY

By DON L. QUINN

Containers must be better, on the average, than those of prewar days because the hazards of shipping will continue pretty much at present levels for quite some years to come.

The various organized groups of shipping container manufacturers are doing their part, in most progressive ways, to contribute to the shippers' understanding and appreciation of dependable facts about the respective merits of these containers.

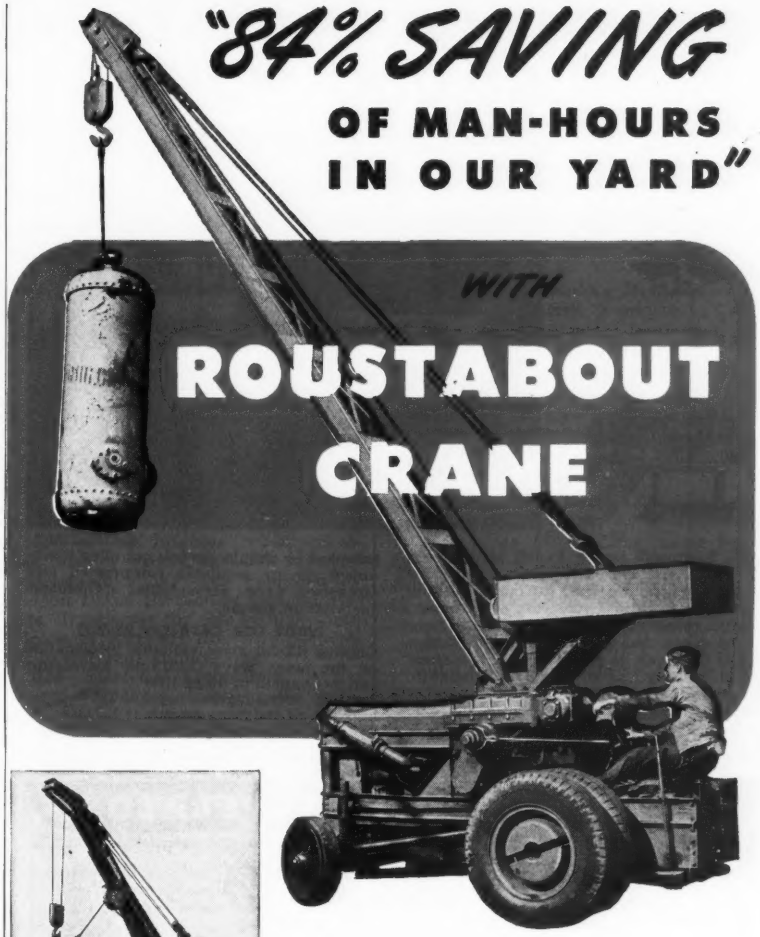
For instance the Wirebound Box Industry has set up minimum standard specifications for their products. The individual members of the association have promised that their recommendation to shippers will never be less than the minimum prescribed. Every box salesman will try to make his prospect conscious that recommendation below this standard should never be considered. Shippers are going to get a lot of dependable facts about the merits of these containers if they wish to have facts.

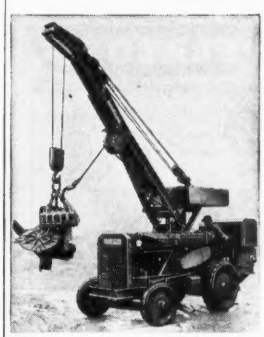
The National Association of Wood Box Manufacturers has set up a new Research Laboratory in the Pacific Northwest, out of which undoubtedly will come facts, dependable facts, about the design, specifications, and other details which will profit any shipper to follow.

The Fibre Box Association is having its individual members make regular laboratory tests of its products every week, and most of them are doing that. This program will not only greatly increase the average quality of their containers, if only by eliminating those which are way below the average in common use; but will make their sales-

"84% SAVING OF MAN-HOURS IN OUR YARD"

WITH ROUSTABOUT CRANE





● With magnet, Roustabout handles large or small castings.

● With grab-bucket Roustabout hustles sand, cinders, etc.

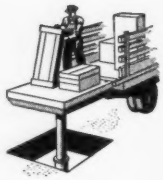
● "Man-hours reduced to 1/7 of former needs." "75% reduction in man-hours." "Saves about 60% on man-hours." "60 to 80% saving in time and man-hours." These are common reports from Roustabout users who mechanize their yards with this mobile load-hustler that goes *where* you want it *when* you want it, keeps things moving, prevents costly delays. Modernly built for years of overwork, loads to 7½ tons. Write now for facts about this profitable Roustabout hundreds of plants wouldn't be without!

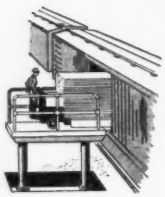
THE HUGHES-KEENAN COMPANY
648 NEWMAN STREET • MANSFIELD, OHIO

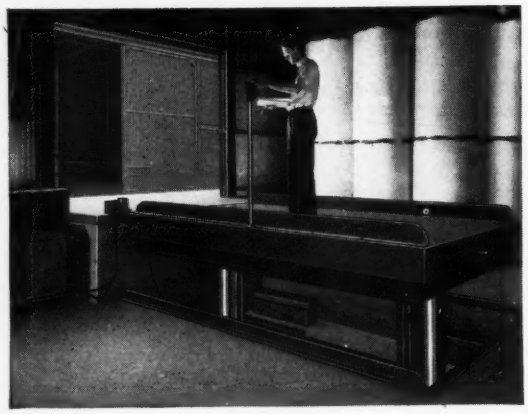
ROUSTABOUT L-CRANE

Roustabout Cranes
By Hughes-Keenan
Load-Handling Specialists Since 1936

HOW ONE MAN CAN LIFT 50,000 POUNDS







Use hydraulic power to lift loads up to 50,000 pounds directly from plant floor to trucks, freight cars or different building levels. Oildraulic Levelators speed plant traffic, conserve manpower, cut costs. Save plant space, too . . . no need for ramps. Plant floor can be poured at grade instead of at railway car or truck bed heighth. Levelator, when down, becomes part of floor and can be trucked over.

Levelator car is raised by hydraulic jack powered by simple electric pumping mechanism (or by available compressed air). Operation safe, dependable, economical. Installation simple.

WRITE FOR CATALOG RE-201

Catalog RE-201 gives valuable information on the many ways Oildraulic Levelators can be adapted to tough lifting jobs. Write for free copy and get all the facts on this modern equipment. ⟶

ROTARY LIFT COMPANY, 1172 Kansas, Memphis (2), Tennessee

Rotary OILDRAULIC LEVELATORS

Six Ways to INCREASE YOUR FLOOR SPACE WITH SKID PLATFORMS, SEMI-LIVE SKIDS & FLOOR TRUCKS

1. Tier loaded skids in out of way places.
2. Use semi-live skids to hasten car and truck loadings.
3. Install specially designed production-line skids to speed handling.
4. Use specially designed super structure units to handle two or three times as much.
5. Two or three conveniently "spotted" lift jacks will handle many semi-live skids—therefore save room.
6. Use removable-shelf floor trucks for parts usually piled on work tables.

The faster a job is finished the faster it will be out of the way —on its way to the consumer.

Write for illustrated literature on Ironbound: 1. Cost saving, 2. Labor saving, 3. Space saving materials handling equipment.

IRONBOUND BOX & LUMBER CO., 30 Hoffman Place, HILLSIDE, N. J.

Ironbound MATERIALS HANDLING DIVISION

men and their customers far more quality conscious than they have ever been before.

These are only a few of the efforts being made to improve understanding and appreciation of what actually does constitute quality merits in shipping containers.

What already is the result of all these efforts?

Shippers are gobbling up everything that is handed them. They are getting so many complaints from their customers about damaged articles in shipping, and pressure from higher-ups in their various organizations is putting the heat on those responsible for their packaging practices.

Costs appear to be less of a factor in shipper customer decisions than ever before.

Organized groups of shippers are taking the keenest sort of interest in industry standards for their products. This progress in industry standards holds greater promise for licking this loss and damage claim situation. The efforts of these organized industries to set up standards will do more to spur individual effort than any other single effort can do.

WOODEN BOXES AND CRATES

By G. CARLBERG, JR.

Central Wooden Box Association

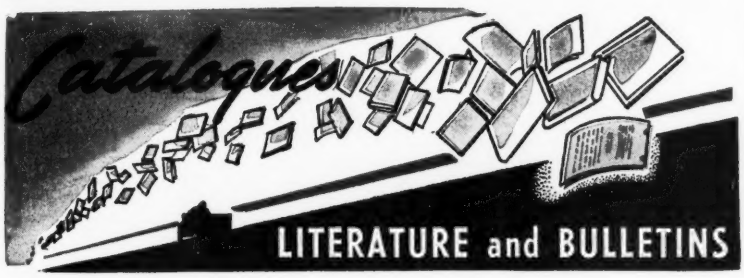
Wooden boxes and crates fall into two separate classifications: (1) Those made from regular sawn lumber and (2) those made from plywood with a framework of wooden cleats.

In general, too, nailed wooden boxes have been the *standard for performance* in exterior shipping containers which the competition has endeavored to equal. Heavy inroads have been made by competitive containers, but despite this, there are still many places where the wooden box is the favored container to do an all-around satisfactory job. Cleated plywood boxes are made in several different styles but all employ the use of strong, thin plywood in a framework of wooden cleats.

The heavy increase in the use of wooden boxes and crates during the war resulted in considerable expansion in the industry. Some entirely new plants were built and a sizable portion of the increased volume was handled by manufacturers of other types of wooden products who went into the wooden box business.

The volume with the old-line manufacturers is now running on an average of 60% of the pre-V-J Day level. It is anticipated that when industrial production reaches its peacetime peak, volume for the industry will be somewhat higher than it is today.

In the organizations of the various wooden box manufacturers, there are men who, by their education, training and years of experience, are qualified as engineers in their field to advise you regarding the best type of wooden container to use in the shipment of any given product.



The publications featured on these pages were written by experts. They are FREE publications. To obtain these use the postcard bound into this issue.

229—Floor Trucks . . . a bulletin by Rapids-Standard Co., Inc., features photos and detailed specifications of two of its floor trucks. Caster construction is described and illustrated by cut-away photographs, and capacities of the various models are given. Installation photos of other material handling equipment are included.

230—Tachometers . . . Bristol Company announces a bulletin describing its line of tachometer recorders and indicators. Complete wiring diagrams, application data, and accessory information are given, including illustrations of instruments, magnetos, and a typical installation.

231—Lift Trucks . . . a series of illustrated lift truck job studies has been published by Towmotor Corporation to aid manufacturers with material handling problems. Detailed methods used at leading firms are covered. Latest study available covers the system in use at a large bearing and bushing plant.

232—Pallets . . . McConvry-Mudge & Co. has condensed in bulletin form the methods, equipment and benefits of palletization. Planning of the unit load is discussed, as well as the selection of pallet size, its construction and engineering. Also covered are principles for rating fork truck capacity.

233—Methods Engineering . . . a folder produced by Bryant Machinery & Engineering Co. discusses engineered handling methods. The folder also pictures a wide range of equipment including: lift and floor trucks, cranes and hoists, stackers and racks, skid platforms and conveyors.

234—Industrial Trucks . . . an illustrated presentation by Salsbury Motors, Inc., on its three turret-type trucks—platform lift, bulk cargo handling, and tractor types. Complete specifications are given, with drawings and cut-away views of the working parts.

235—Diesel Engines . . . a pocket-size booklet written in verse for easy understanding has been published by Detroit Diesel Division of General Motors. It presents the role of high-speed Diesels in everyday life, with sketches of 40 different applications.

236—Electrical Connectors . . . a 12-page brochure describes the basic principles of the mechanical connectors produced by National Electric Products Corp. Cut-away models and schematic drawings are used to illustrate the material compiled to provide an exact understanding of connector design and function.

237—Battery Charger . . . Motor Generator Corporation offers an illustrated bulletin on one of its automatic generator sets for direct current charging of motorized lift truck batteries. General specifications and operation details are given. The material includes a list of latest authorized price changes.

238—Hoisting Equipment . . . a summary of the line of hoists, derricks, whirleys and similar equipment produced by Clyde Iron Works, Inc., is presented in an illustrated catalog, which also lists specific bulletins available on all equipment pictured. The bulletins contain complete descriptions and specifications.

239—Motorized Trucks . . . The Moto-Truc Co., Cleveland, offers descriptive literature on its motorized hand trucks, including high-lift, platform and tow models for semi-live skids. Described are special attachments for handling ladles and flasks in foundries, lifting die blocks in and out of large presses and hammers, etc. Both motive power and lifting power is provided, and the units are equipped with a recently perfected motor-driven hydraulic pump.

240—Truck Loading Methods . . . a booklet by Clark Equipment Co., showing numerous methods of loading and unloading highway trucks. Safety hazards, loss and cost reduction are discussed from a handling standpoint. Specific comparative figures and data are included on operations involving the method described in this illustrated booklet.

241—Elevating Devices . . . Rotary Lift Company presents a catalogue on various types of handling using hydraulic lifters known as Levelators. Adaptations of these devices are shown in paper manufacturing, lumber handling, bag baling, grain dumping, and other phases of the lifting principle. Detail drawings and specifications are given.

Plan now to attend the First National Material Handling Exposition—Cleveland, Jan. 14-17, 1947.

IT'S 10 TO 1 AN
FMC ACCORDION CONVEYOR
can handle your package handling problems

AVAILABLE NOW! Sturdy, steady and dependable, flexible enough to meet scores of different material handling needs. Saves valuable man-hours—reduces handling costs...ends "aisle-jamming." Collapsible, gravity operation, can be quickly set for practically any curve or turn. Roller design keeps box on conveyor regardless of curves. For free literature on FMC standard and portable conveyors, address Dept. E.

FOOD MACHINERY CORPORATION
RIVERSIDE DIVISION
RIVERSIDE, CALIF.

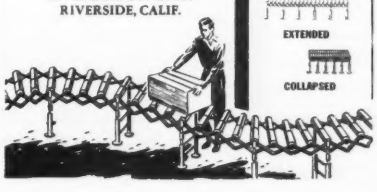
Sets up anywhere in a few minutes

CURVES
Roller design keeps box on conveyor regardless of curves

S TURNS

EXTENDED

COLLAPSED



OPPORTUNITIES

Men wanted *Jobs wanted* *Lines available*

RATES: minimum, 25 words, $2.00; each additional word, 10c. Bold type or all capitals: minimum, 25 words, $3.00, additional words, 15c. All insertions are payable in advance.

JOBS WANTED

Graduate engineer opening machinery sales agency wishes to represent manufacturer of materials handling equipment New Orleans area. Availability and description of products desired. Box 9146 FLOW.

LINES WANTED

Manufacturers' Representative
New York City Area
Seeks Sales Agency for a
Fork Lift Truck
Gas Driven
Have Large Sales Organization, Warehousing Facilities and Maintenance Department. Box 7146, FLOW.

Rack loads of lasted shoes are dispatched from second to fourth floor via vertical conveyor.

Typical line-up of castered racks in production. Shoes are kept at convenient level for operators.

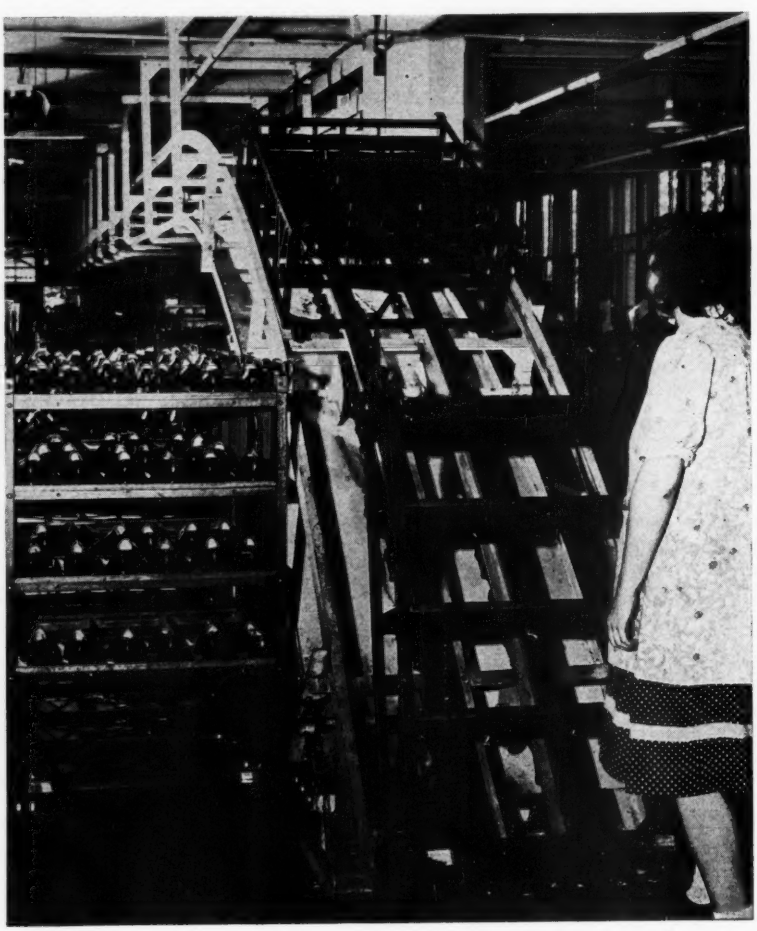
THESE ON-THE-FLOOR RACKS ALSO TRAVEL OVERHEAD

The Nunn-Bush Shoe Co. conveys on-the-floor equipment between—and above—floors in certain transfer operations. Vitally needed areas are thus left free for production, and the castered units are 'pushed' mechanically.

OF INTEREST are certain routing methods and facilities used by the Nunn-Bush Shoe Co., Milwaukee, Wis., to reduce floor traffic and conserve square footage in several production departments.

The lasting department, for example, is located on the second floor, and from here the racks of lasted shoes are sent up to the "making" room located on the fourth floor. For this "up and down" traffic a vertical conveyor is used, which is shown in one of the photos.

These racks are castered shelf trucks, except that rungs are used instead of continuous shelves. Each rack has four shelves, and the units are about 4½ feet high, 2¾ feet long, and approximately 15 inches wide. Each shelf is arranged in six sections, one for each of three pairs of shoes standing side by side. Thus the individual racks accommodate 12 pairs of shoes, called a "case." And a case is the unit in which the shoes are handled in



Loading point of two-chain conveyor which carries the empty racks overhead for a distance of about 250 feet.

production. The sizable Nunn-Bush factory constantly has thousands of pairs of shoes moving through the manufacturing departments, and hence the routing of many hundreds of shelf trucks has received special attention in order to avoid floor congestion.

Routing Between Floors

The vertical conveyor system installed some time ago by the company has eliminated this problem in transferring the lasted shoes between the second and the fourth floors. (Similar conveyors also serve other departments.) In the lasting department the loaded racks are pushed onto the conveyor through an opening. The carrying surface consists of two horizontal lengths of 4″x4″x⅛″ angle iron bolted to an endless chain. On either side of the shaft are two vertical side plates, over which the chain passes. In order to keep the chain in tension and following a steady vertical path,, gusset-shaped ball-bearing-equipped lugs have been attached to it, permitting them to glide smoothly over the side plates. Thus slack is absorbed, buckling of the chain avoided, and chain wear held to a minimum.

These vertical conveyors are controlled and operated by manual and automatic switches. The automatic switch stops the conveyor at floor level, allowing the rack to be withdrawn either mechanically or manually from the other end. After the shoe rack is placed on the conveyor, a manually controlled start button starts it. These start-and-stop buttons energize a coil, which in turn operates a relay switch. Safety switches are also installed to prevent the racks from going beyond the floor limit.

On the fourth floor, the loads are discharged mechanically. The side plate holder releases the rack and a spring-operated kick-off lever pushes it several feet ahead, down a slight, inclined metal ramp. At this point the carrier's underside is engaged by a dog on a floor chain which operates between channel guides. This floor conveyor propels the racks at a pre-determined pace through the drier tunnel, whose entrance is a few feet farther on. The emerging units then advance some 20 feet between channel guides from the exit end of the drier tunnel.

If the racks should not be removed as they arrive from the drier, the units would break the floor chain after forming a solid line from the drier tunnel. To prevent this possibility, a micro-switch has been installed. As the racks arrive at the end point, they automatically hit an angle iron lever, which operates the switch. The latter shuts off the floor chain, forestalling any possibility of damage. At the same time the switch also shuts off the drier, which would prevent the shoes from being overdried or wind burned. Thus a foolproof safety factor is provided for the entire setup.

Convenient Work Carriers

Once released from the powered floor conveyor, the castered racks are again manually advanced between the closely spaced work stations in the layout. The shelves on the racks are at a convenient work-

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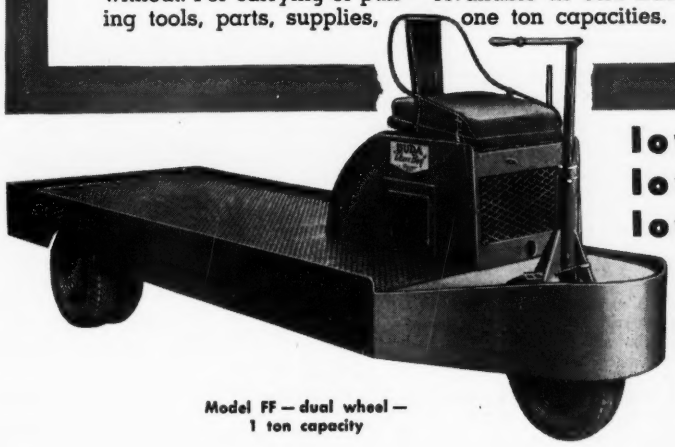

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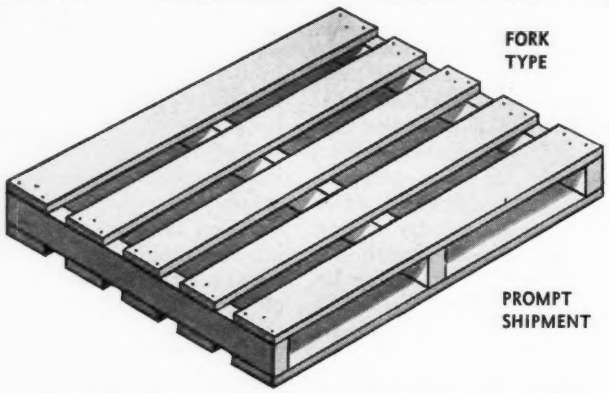

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Ask for Bulletin IPOO

ing level for the operators who first remove the shoes and then replace them on the trucks upon completion of their particular tasks. The two shoes of each pair are thus kept together, permitting the craftsmen to apply details uniformly to the units of each pair. And by use of the vertical conveyor the numerous racks are transferred between floors with a minimum of confusion and pushing.

The value of the racks as work carriers is also illustrated in another operation—in the last pulling operation which is a focal point in the flow of these units. A slight change adapts the same racks to particular needs as the product nears completion. For example, as the shoes arrive at the last pulling station, the soles are finished and have a high polish which must be protected through subsequent processing operations. The shoes, minus the lasts, are therefore placed on racks with cloth-covered rungs, while the detached lasts are placed on the "factory" racks which do not have this protective covering. The factory racks are positioned to the left side of the last pulling machine, the cloth-covered ones to the right. Thus the lasts go to the left, the nearly completed shoes to the right. The rack loads of lasts are from here sent via another vertical conveyor to the lasting department on the lower floor. The cloth-covered racks are pushed to the nearby treeing department, where the final finishing of the uppers is performed.

Racks Now Move Overhead

At the end of this department the finished shoes are packed—the 12 pairs on each rack constituting the number placed in a packing case. From the packing department the empty shelf trucks must be returned to the last pulling station. The distance between these two points is about 250 feet. With production space at a premium, it is not difficult to visualize the amount of floor area that would constantly be taken up if the hundreds of racks had to be pushed over the floor between these two departments. The Nunn-Bush Shoe Company's engineers avoided this situation by installation of the

overhead two-chain conveyor shown in one of these photos.

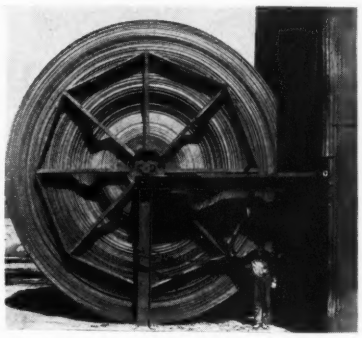
From the packing department the empty racks are pushed to the start of this line which is close by. A slight push of the hand is sufficient to tip the racks sideways onto the moving chains equipped with dogs. The units are thus carried up the short inclined section and from here they travel close to the ceiling the entire length of this wing, and then through another wing adjoining it at right angles. Thus the floor area under the conveyor can be utilized for production purposes and for the flow of loaded racks advancing in the opposite direction.

During their overhead travel, the racks are transferred to another conveyor line which runs at right angles (through the adjoining wing). When the units arrive at the end point, they are lowered mechanically to the floor level on another inclined section similar to the one shown in the photo.

Thus, by use of the vertical and overhead conveying system, the Nunn-Bush Shoe Company is enabled to move a considerable number of on-the-floor shelf trucks between and above floors. Without this overhead handling system, hundreds of square feet of floor area would be required in transferring the many empty units. The present system permits the use of space close to the ceiling. Thus heavy on-the-floor traffic is avoided, space is gained for the loaded racks, and operators are not needed for pushing the empties back to the last pulling department.

ALMOST A MILE LONG

THIS is one of the largest single conveyor belts ever made, which has recently been completed. The roll contains 5,100 feet of 48-inch, five-ply belt and weighs about 72,000 pounds. The diameter of the roll is 25 feet. A special frame



and windup were built at the user's plant. In making the installation, the new belt (six lengths spliced together) will be fastened to the end of the old, pulled over the pulleys, and spliced endless on the job.—Courtesy, The B. F. Goodrich Co.

IN YOUR NOVEMBER ISSUE

Handling at Willow Run—devices used in assembling America's two new cars . . . Positioned for Production, a revealing story showing the all-important part of proper positioning of work in production . . . Stone handling at a leading quarry company . . . An exceptional story on a crane handling operation—and other articles of practical value.

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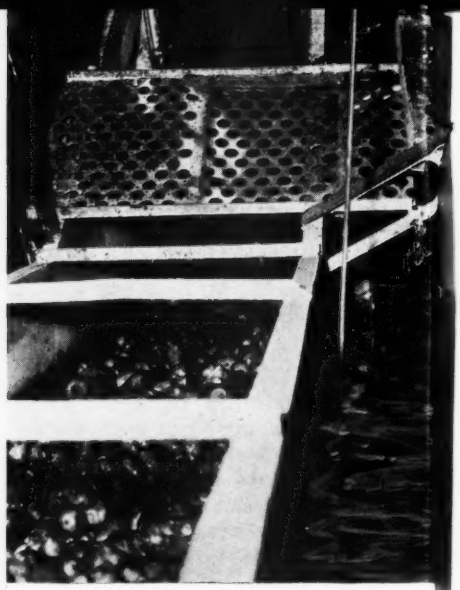
THESE POTATOES *Float* TO PROCESSING

Twenty-five carloads of Idahos become 140,000 pounds of dehydrated potatoes —the daily capacity of the Simplot Dehydrating Co., Caldwell, Idaho. Water conveyance by use of flumes in connection with various types of conveyors results in high-production operation.



This flight conveyor moves potatoes from flumes to processing. 80% of water, bottom, is reused.

BUILT up from a small onion-drying operation in 1941, the Simplot Dehydrating Co. is today the nation's largest plant of its kind. During the war the company supplied one fourth of all dehydrated potatoes to the Army Quartermaster Corps. The present flow of potatoes through the 1,700-foot-long processing lines has been largely a matter of invention and experiment by President Jack Simplot. Without precedent to follow, he built up the huge plant that now handles 25 carloads of potatoes a day.

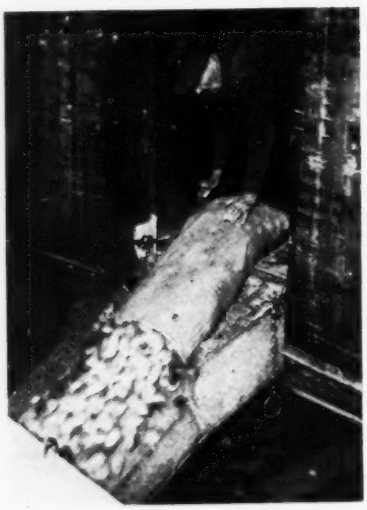
The product is received from two sources—a giant warehouse with a capacity of 1,000 carloads, and from spurs alongside the main processing building. With 11 steps in processing requiring a variety of operations, the company has ingeniously combined "water conveyors" (flumes) with flight, belt, and gravity conveyor lines.

Flumes Pre-Wash Spuds

The operation begins with the three flumes, "water conveyors" which carry the product to the warehouse as well as to the processing plant. Two flumes run parallel with the main building, while the third one makes a 90-degree turn into the potato warehouse. The flumes perform the double service of pre-washing the potatoes as well as carrying approximately 450 tons per day. They are supplied with 500 gallons per minute of artesian water from a pump house at the rear of the plant, recirculating 80% of the water. The two parallel flumes are 200 feet long, the warehouse flume 150 feet. All three converge on a central point at the head of the processing line, (see photos), where the "water conveyors" transfer the potatoes to a 45-degree inclined flight conveyor to begin processing. Potatoes floated into the plant in this way do not undergo the danger of bruising, cuts, and other damage, President Simplot pointed out.

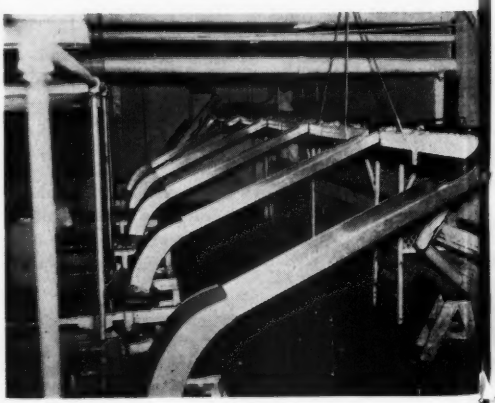
Interesting Inspection Tables

An overhead conveyor, a ribbed metal belt three feet wide, carries the potatoes into a steam precooker



Chuted from boxcars, potatoes enter plant via flume. Carried by water, they arrive pre-washed.

Gates on feeder line, right, distribute potatoes thru stainless steel chutes to inspection tables.



and special bath to loosen the skins. The conveyor carries them next to a spray washer which pours 500 gallons per minute over the "spuds."

From this operation the potatoes tumble down a stainless steel chute into a rotary barrel washer, at 90 degrees, through which they move 90 degrees to the right, spun rapidly to remove the loosened skins. A small flume, two feet wide, carries off refuse for hog food use into a hopper, beneath the barrel washer.

Special Inspection Tables

Gleaming, white potatoes are now transferred to the next transportation arrangement, an overhead rubber-belt type, which feeds seven conveyorized inspection tables via stainless steel chutes. One of the photos shows the arrangement of the chutes branching off at right angles from the overhead feeder line, where specially designed gates control the flow to inspection. Simplot developed these tables and built most of them in the plant, due to lack of commercially manufactured equipment at the time. Fifty feet long by four feet wide, the table surface consists of a single broad rubber belt, framed in metal tubing, and divided into three sections by 8-inch high vertical partitions, which "recirculate" the potatoes during inspection, so that any defective spud which gets by one of the women inspectors comes back up the center for a "recheck". Over 300 women are stationed at the seven tables, which are individually electrically powered to take care of fluctuations in production.

Inspected and passed potatoes are carried by flight conveyors from the end of each of the seven tables to a row of six dicing machines. These transform the product into ½x½x½ strips, or Julienne size for dehydrating. The diced potatoes fall on a broad six-foot-wide metal conveyor, which moves them through an 85-foot steam blancher, moving slowly to cook them at 207 degrees temperature. The conveyor moving through the blancher is large enough to take the full output of all seven inspection tables, although moving at less than half of the supply conveyor's speed.

Diced and cooked potatoes are discharged from the blancher on

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an agitator platform with screens, which shakes down an even layer of the product onto 3x6-foot wood-

Hopper catches inspected potatoes, below. Inclined flight conveyor elevates them to dicing machine. Belt conveyor, right, moves dry product from drying bin through final inspection to packaging department.

en dehydrator trays stacked beneath. As these are filled they are loaded into 25-tray stacks on rail trucks which carry them through the dehydrating tunnels.

Handling the Dried Product

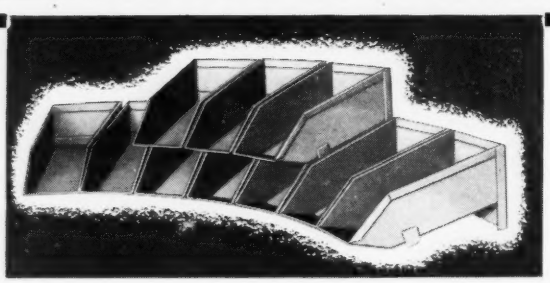
The lines of cars move through any of 130 oil-fired dehydrating tunnels counter to the flow of heated air. They are propelled by electrical power units. An ingenious system of switches and cross track rails permits the cars to be shunted in either direction along the face of the thirty dehydrating tunnels, and into the proper tunnel.

After dehydration, the 800-lb. load of wet potatoes on each truck has become 150 pounds of rock-hard dried strips. Emerging trays are lifted by a vertical conveyor into a huge bin, circulating heated air, by which the remaining 10 to 12 per cent of moisture in the potatoes is removed by 12 hours' exposure.

Packaging is fully automatic. Potatoes from the final drying bin

Carried down outside sections of conveyor table, potatoes return through middle for recheck.

are lifted by a "scoop" type conveyor to an overhead line which carries them into a funnel-shaped vibrator filler in the rear building. Empty five-gallon metal cans are loaded on a conveyor from freight cars outside, and are brought in overhead to the packaging line, which dips down under the agitator-filler. The filler's capacity is 1600 two-can cases in eight hours. The full cans pass under an inspection light, then to a station where two at a time are dropped into a prefabricated wooden case. The cases are mechanically nailed shut,



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then wired for overseas shipment by two men operating wire strapping equipment at the end of the line. The completed cases are lifted off the packaging line and transferred to a loading conveyor which carries the boxed units into freight cars at the rear platform. The Simplot Company operates its own box plant, turning out 1600 wooden cases every 8 hours, as well as its own sawmill for converting raw lumber. An automatic box assembly machine turns out five complete boxes a minute for the packaging room.

This almost completely mechanical handling during processing and packing results in an output of upwards of 140,000 pounds of dehydrated potatoes per day, most of which now goes overseas for relief of starving European nations.

LETTERS TO EDITORS

(Continued from page 11)

different industry, standardization obviously should exist. — J. N. Hamilton, Merchandise Preparation Department, Montgomery Ward, Chicago.

The width of forks varies from from four to seven inches by increments of one inch for general use, depending on truck capacity and make of truck. The average outside maximum spread is 38 inches, which also varies with the capacity and make of truck, whose overall width is the limiting factor. Pallet hand lift truck arms are usually 10¼ inches wide. Accepted practice for safe operation is to allow eight inches for fork trucks only and 12 inches where pallet hand lift trucks are also apt to be used, as absolute minimums.—Ed.

To FLOW:

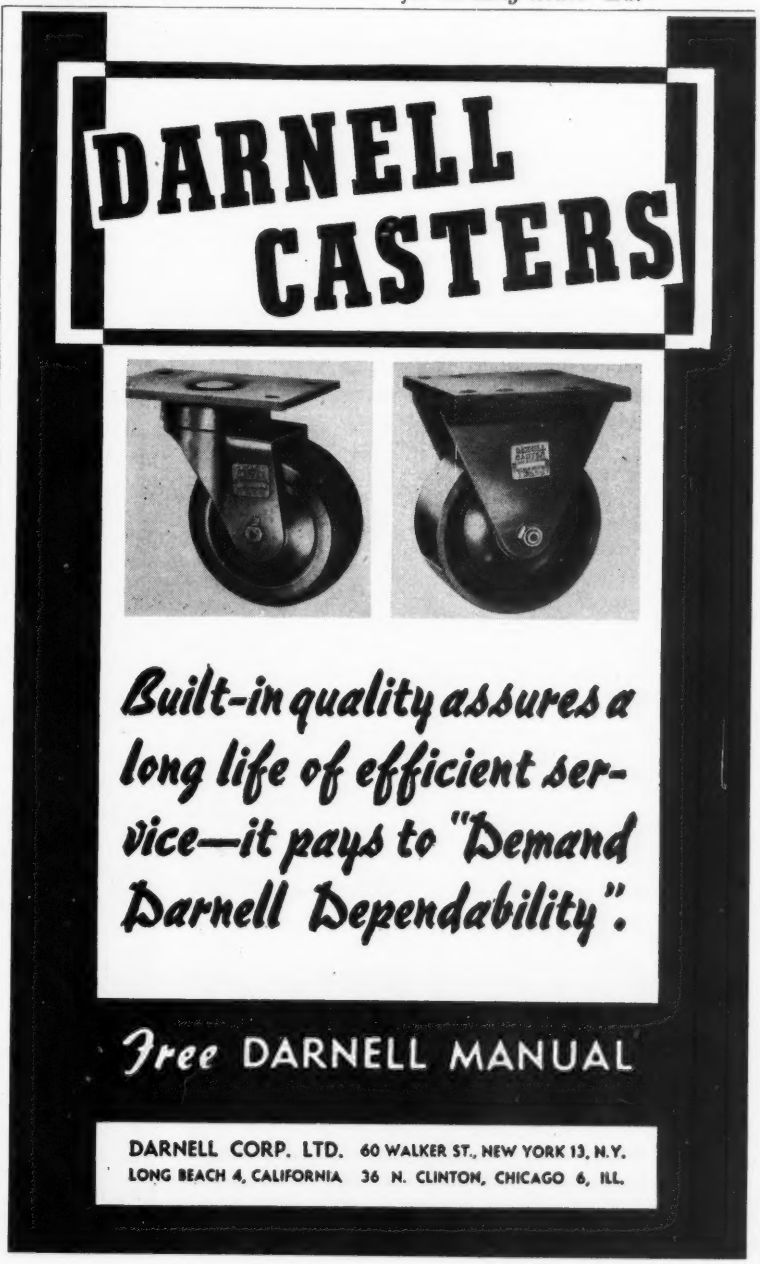
Bag Handling

We have been reading your FLOW magazine with much interest and have been getting some excellent ideas from this material. Since our Stock Feed Manufacture requires the handling of material in sacks and bulk carloads, we are anxiously awaiting to see some articles published on these handling problems.—N. V. Kruse, Technical Director, Central Soya Co., Inc., Decatur, Indiana.

Here are some references to FLOW articles which in the past covered various phases of bag handling operations.

Sacked salt, including bulk carlots, played a prominent part in the Diamond Crystal Salt article, March FLOW, page 20. The New Products department of the same issue, page 48, illustrated two similar operations.

Movement of loads of flour is illustrated in the Ward Baking Co. story. May FLOW, page 22. Palletized loads of bagged coffee are covered in the Maxwell House article, May FLOW, page 32. The handling of small sacks of flour is illustrated in the wholesale grocery article, April FLOW, page 46. The solution of a bagged material problem is fully discussed in the Hammermill Paper Co. article, July FLOW, page 21. A detailed article on a bagged and bulk material handling operation is also planned for an early issue.—Ed.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formed to check for leakage from the coils. The complete assembly is then cartoned for shipment. The lower deck of this double-deck gravity conveyor system is slanted in the opposite direction (to that of the upper deck) to carry the cartons to the truck loading dock. This feature utilizes the space next to the wall which is normally non-productive, and eliminates using a wider area.

Air and Hydraulic Hoists Do the Lifting

Until recently, the handling of tanks (which are the heaviest parts of the water heaters) was accomplished by manual lifting at several points during the assembly. Under the present method, all movement of tanks during assembly is done on gravity rollers with air or hydraulic hoists doing the lifting.

When the tanks are brought to the assembly line on trucks, they are upended on a section of gravity rollers, which are close-centered to give smooth conveying. The heater base is assembled in a series of operations, involving rather unique handling. The base, a three legged metal support, is placed on a metal plate which is positioned to permit sliding the tank from the gravity rollers onto the top of the base. Formerly, the tanks were manually lifted and positioned. After the tank is located, the base is raised on the supporting plate by an air cylinder to working height. This permits the operator to fasten the bolts on the legs with an air-driven wrench, and also two nipples at the top of the tank.

When the leg assembly is complete, the unit is pushed on the rollers to the next station where the insulation is installed. An inner steel jacket is attached first by slipping it over the tank, with bolts being added at the base. In order to assemble the insulation (fiber glass), two "horns" are placed about the tank after the fiber glass bats have been wrapped around it. This retains the fiber glass insulation while the outer enameled jacket is being slipped over. These horns are actually two semi-circles of steel plate with hooks at the top, and a latch at the junction of the two for locking. An air hoist is used to position the horns as they are inserted over the fiber glass which is stretched around the outside of the tank. The latch at the top fastens the plates until the outer jacket is slipped over. The latch is released and then the horns withdrawn by the hoist. This permits the fiber glass to seat itself between the inner and outer jackets, with a resulting air space between the inner jacket and the tank proper.

The assembly is then slid onto a section of gravity rollers mounted on an electric elevator, which raises the unit and brings the working area on the tank to waist height. It should be remembered that the over-all height of these tanks is approximately six feet, and hence this positioning eliminates stooping and stretching on the part of the operators.

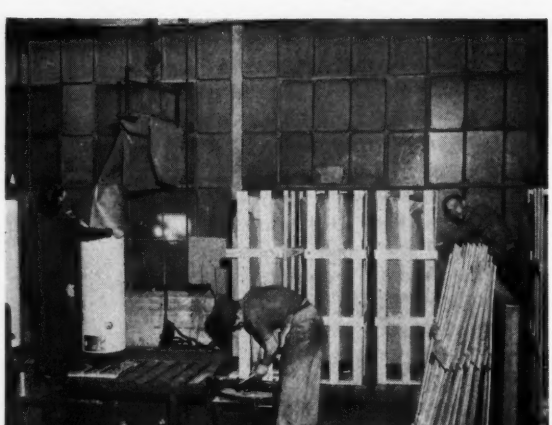
Handy "Bag" Holder

The drain and thermostat are next added to the unit, as it is rolled on gravity conveyor toward the packing zone. Air-operated wrenches and screw drivers are used likewise at these points. After testing for leakage, the top is attached and the thermostat and pilot connected. The last operator inspects the unit and slips a "bag," a Kraft paper cover, over it. The paper covers are pulled from a rack suspended from the ceiling, with the open ends of the bags hanging toward the top of the water heater. Formerly these bags were stacked on a pile next to the line, which meant they had to be flipped to open them for packing purposes.

At the next station the water heaters are crated in wire-bound containers. A two-wheel hand truck removes the heaters to the shipping dock or the loading platform, for shipment by box cars.

Operator withdrawing "horns" by air hoist controlled by button in floor (arrow). Three-button control of elevator shown farther down line. Hand lever in foreground controls heater base elevator.

Operator covering water heater with bag suspended from ceiling support. Shipper nailing crate on turntable gravity section.



Efficient Handling Pays

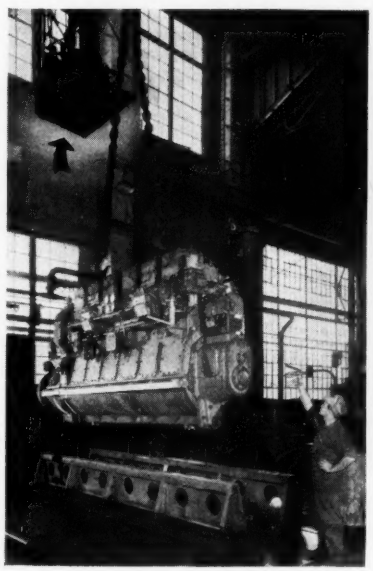
Although the Lawson Mfg. Co. uses an incentive system of wage payment, the system in any plant is only as good as the methods employed to make it effective. One of the most important of these is efficient handling methods, which help the operator to produce more with less effort.

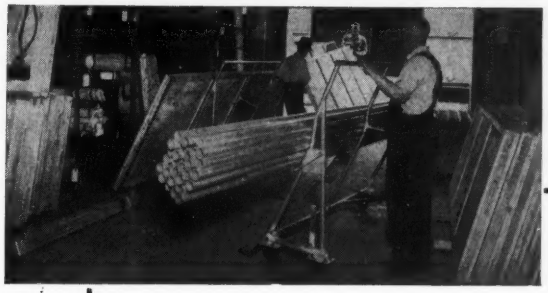
This small plant has provided the handling tools to produce thousands of water heaters each month. Since the handling setups have been revised, the output has increased substantially, according to company officials.

We believe this more than proves that efficient handling pays, whether you employ 80 or 8,000 workers.

EXTENDED CRANE CAB

IN HIGH manufacturing bays the crane cab may be 50 to 60 feet from the floor. At this height normal conversation is inaudible and standard signalling from hookers-on difficult to distinguish. To minimize these hazards, this company has added an extended cab which hangs approximately 20 feet from the bottom of the crane rail. The photo shows a huge compressor being positioned onto testing ways, while the hooker-on gives signals which can be easily seen by the crane operator.—Courtesy, The Cooper-Bessemer Co.





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MATERIAL HANDLING ENGINEERS

SURVEYS AND RECOMMENDATIONS
MODERN MECHANICAL SYSTEMS
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On this page and the one following FLOW presents the first edition of its new service department. This section has been designed on the request of representatives who want to identify themselves in their local areas with the nationally advertised lines they carry. Rates are available on request to the publisher.

HOW TO CUT CORNERS

. . . ON ALL MATERIALS HANDLING PROBLEMS

CALL IN
THE OHIO EQUIPMENT COMPANY, INC.

Specialized Materials Handling Engineers Who Offer:

- The Experience to Guide.
- The Ability to Serve.

THROUGH THESE DEPENDABLE FACILITIES

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- SALES DEPARTMENT—offering the finest equipment manufactured by America's leading manufacturers:

  Industrial Trucks, Hand Lift Trucks, Skid Platforms, Electric Hoists, Pallets, Portable Lifters, Storage Racks, Warehouse Trucks, Truck Wheels, Skids, Boxes, Lockers, Scales, Battery Chargers, etc., etc.
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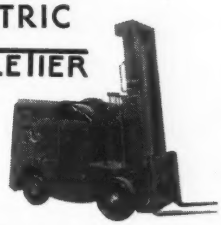
The NEW CRESCENT ELECTRIC PALLETIER



We have this completely modern fork truck in stock for immediate delivery. The PALLETIER is the answer to efficient, low cost materials handling. Full vision. Easily accessible controls.

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Island Equipment Corp.
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Two and Four Wheel Hand Trucks, Semi-Live Skids, Industrial Casters, Wheels and Dollies

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Chicago, Illinois
Portable Wheel Conveyors

NOOK AND O'NEILL, INC.
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Electric Trucks - Industrial Gasoline Trucks
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- **TOTE BOXES**
- **SKIP BOXES**
- **PALLETS**
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Made to Specifications

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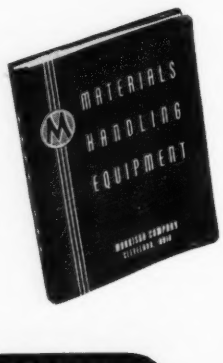
As Specialists In MATERIALS HANDLING We Offer The Services Of Our Trained Engineers

● We would like the opportunity of consulting with you on your materials handling needs and will gladly send members of our engineering staff out to your plant to make analysis and recommendations. There is no obligation. Receiving, processing, shipping or storage and all of the other factors which must be taken into consideration will have our most careful attention.



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LET US MAKE AN ANALYSIS OF YOUR PLANT WITHOUT CHARGE

NORTHWESTERN OHIO'S
STOCKING
Material Handling Equipment
DISTRIBUTOR
THE OHIO BELTING AND TRANSMISSION CO.
Telephone: ADams-8151
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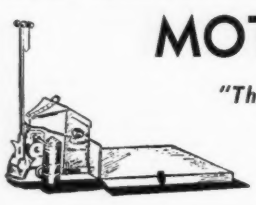
WE ARE DISTRIBUTORS OF
MOTO–TRUC
"The Original Motorized Hand Lift Truck"



Motorized Lift Trucks for Skids and Pallets.
High Lifts for Tiering.
Electric Drive. Electric Lift.

MATERIAL HANDLING EQUIPMENT CO.
1953 EAST 59TH STREET CLEVELAND, OHIO

MATERIAL HANDLING

Lift Trucks	Floor Trucks
Skids	Casters
Lo-Head Electric Hoists	Industrial Power Trucks
Portable Elevators	Cranes
	Conveyors

G. C. ASPLIND
83 S. HIGH ST., COLUMBUS 15, OHIO

This is the FIRST PRESENTATION of the Section

"WHERE TO BUY IT LOCALLY"

This section will be a monthly service for our readers and for the LOCAL agencies and representatives of the material handling equipment manufacturers of the country.

Advertising rates for this section are available upon request from the publisher. Address Local Section, General Manager, FLOW Magazine, 1240 Ontario Street, Cleveland 13, Ohio.

For additional information on these products, write Dept. 5, Flow Magazine, 1240 Ontario St., Cleveland 13.

STRAPPING MACHINE

SIGNODE Steel Strapping Company, Chicago, announces the A-2 Seal Feed Strapping Machine. This semi-automatic one-piece strapping tool tensions, cuts and seals in three continuous operations. The manufacturer states

that it will strap boxes, cartons, crates, packages or bundles in a wide range of sizes and weights. The A-2 is available for use with ⅜" x .015, ⅜" x .020, ½" x .015, and ½" x .020 strap.

BARREL AND DRUM-SKID

A BARREL and drum skid with a 1200-pound capacity is now being manufactured by the Ironbound Box and Lumber Company, Hillside, New Jersey. According to

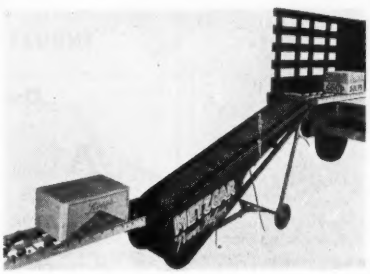
the release, the hardwood rails are full-length and reinforced with heavy steel bands. Steel hooks at one end anchor it securely to the back of motor trucks or to loading platforms. The unit is available in three standard sizes: 8′, 10′ and 12′ lengths.

LAYOUT MODELS

THE production of industrial models has been announced by Stark Industrial Models, New York City. The concern states that it will supply designers, engineers, architects, advertisers and manufacturers with all types of display or working models of machinery, industrial plants, architectural layouts and product and consumer goods. The models will be made from metal, wood and plastics according to the customer's blueprints.

BELT CONVEYOR

A POWERED belt conveyor with automatic belt tensioning is announced by Metzgar Company, Grand Rapids, Michigan. Ac-

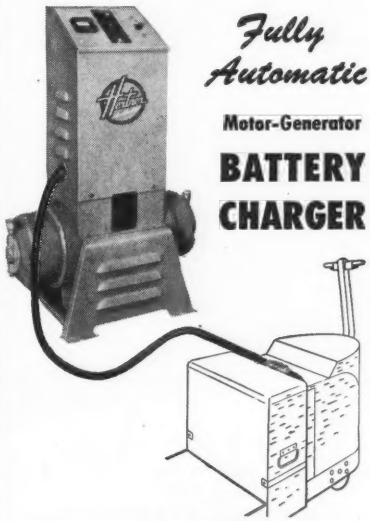


cording to the company, the belt can be tracked to any part of the slider boards proper and will remain as it is adjusted. The basic machine has a six-foot exposed belt surface. The length can be increased in multiples of one foot up to ten feet.

It is adjustable from a horizontal 18" high machine to 45-degree pitch, suspended by heavy compression springs and ball bearing, rubber-tired wheels. A variable belt speed of forty to fifty feet per minute is included, states the manufacturers.

For PEAK PERFORMANCE *from your Motorized* **LIFT-TRUCKS** *Every Day*

use the HERTNER Type "H"



Fully Automatic
Motor-Generator
BATTERY CHARGER

FULLY CHARGES LEAD-ACID BATTERIES
in 8 hours
NICKEL-ALKALINE BATTERIES
in 7 hours

Automatic Charging Rate
Amount of charge is governed by completely automatic controls—over-charging is impossible, yet a fully rundown battery can be completely charged in normal charging time.

Automatic Shut-off
Completely automatic controls cut off the charge and shut down the motor-generator when the battery reaches full charge.

Automatic Restart
In the event of power failure, generator shuts off automatically and when power is restored motor-generator automatically restarts and charging is resumed.

"Automatic" Economy
Due to the inherent characteristics of motor-generator design, the Hertner Type "H" charger provides "automatic" economy.

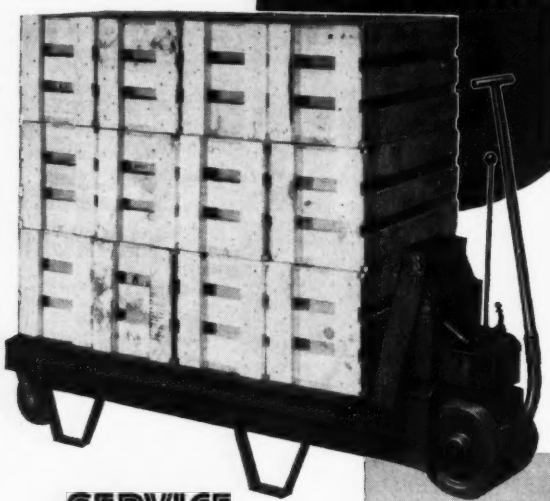
Write for Bulletin 101 describing Type "H" single-battery charger. Hertner Type "H" chargers are also available for charging 2 or more batteries at one time. Write for Bulletin 102.

The HERTNER Electric Co.
A General Precision Equipment Corporation Subsidiary
Motors • Generators • Motor-Generator Sets
12756 Elmwood Avenue, Cleveland 11, Ohio
Representatives in principal cities throughout the world

You Need It

IN YOUR PLANT

TO LIFT AND LUG HEAVY LOADS FASTER, EASIER . . . IT'S HYDRAULIC!



SERVICE HYDRAULIC *Lever Lift* TRUCK

Sure it's needed—wherever there are loads up to 3 tons to lift off the floor and take for a fast, easy ride. Just back the Service LEVERLIFT under a skid. A few easy strokes (only 30 pounds per stroke) lifts the load. And easy-rolling wheels let you "take it away" with surprisingly little effort. Available in capacities of 2500 lbs., 3500 lbs., 5000 lbs., and 6000 lbs. 26 different platform sizes in each capacity. Steel, rubber or plastic wheels. Check the features listed here—then decide to look into LEVERLIFTS for your plant.

Write for descriptive Circular Today.

What a Truck! Check These Points:

- Simple Hydraulic Lifting and Lowering Mechanism.
- Steel Deck Allowing Use Without Skids.
- 10" Front Wheels for Easy Pulling.
- Ball Bearing Turntable for Easy Steering.
- Accurate Control of Lowering Speed.
- Easy to Operate in Crowded Areas.
- Every Stroke a Power Stroke—No Bending.
- 30 lbs. Effort Lifts Heaviest Loads.
- All Welded Construction.

Cost-Saving Service Materials Handling Products

Motowlift Gas-Powered Hydraulic Lift Truck | Service Shoplifter | Service Liftable | Service Electric Hydraulic Lifter | Service Hydraulic Leverlift | Service Leveler

SERVICE CASTER & TRUCK DIVISION
of Domestic Industries, Inc.
Executive Offices: 231 South LaSalle Street, Chicago 4, Illinois
Factories at Albion, Michigan, and Somerville, Mass.
REPRESENTATIVES IN ALL PRINCIPAL CITIES

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1 **TIES A TIGHTER TIE . . .**
STEELBINDER puts *no wedge or lip* underneath the strap. Strap stays tight, is not loosened as the tool is disengaged.

2 **TIES ALL SIZES AND SHAPES . . .**
round, square or irregular. Does not require a base on which to rest the tool.

3 **USES VARIETY OF STRAPPING . . .**
3/8", 1/2", 5/8" and 3/4" steel strap up to .028" thick, as well as FIBER-STEEL and STUR-D-STRAP.

4 **CUTS OFF STRAP AUTOMATICALLY . . .**
an original A. J. Gerrard feature.

STEELBINDER saves time and work on all but heaviest duty strapping jobs. Where heavy duty .035" thick strapping is needed, use the A. J. Gerrard BULKBINDER.

A. J. GERRARD & CO.

221-A North LaSalle Street, Chicago 1, Illinois 6-A

The Line That Binds, Braces and Fastens Everything You Ship

FOR SALE

INDUSTRIAL SUPPLY BUSINESS
Excellent Future
Owner Wishes to Retire

A healthy growing industrial supply business with over 3,000 accounts in Northern California, Southern Oregon and Nevada. Present lines consist of material handling equipment, shipping room supplies, wiping materials, rest room and floor supplies. Sales run over $250,000 a year, with profits well over $20,000. These figures can be doubled with additional advertising, salesmen and new products.

Present inventory and fixtures at cost is about $40,000. Warehouse Building can be bought or rented.

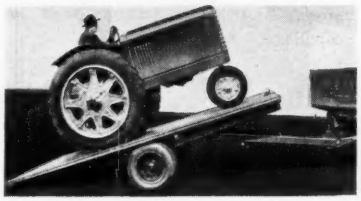
The GOOD WILL cost well over $20,000 to establish to present time. What is this worth to you? For further details with your expressions, write to:

V. W. DENNEN

1926 Everett St., Alameda, Calif.

TILTING-PLATFORM TRAILER

PRODUCTION of a new two-wheel trailer with tilting platform and patented load-leveling hitch is announced by the C. N. Monroe Mfg. Co., Flint, Michigan. The hitch is designed to bring the platform to level, or lower it to loading dock height by adjusting with the hand crank.



The platform measures 8 x 4 feet and is available in either welded steel or heavy hardwood plank construction. It is mounted on a heavy-duty welded pressed-steel frame which is reinforced by cross members. According to the release, loads up to 8000 lbs. may be transported.

INTERCOMMUNICATION UNIT

DUST and moisture-proof, metal housed, industrial type intercom staff stations for remote and privacy operation have been recently introduced by Executone, Inc., New York City. According to the manufacturer, they are designed to solve communication problems in refrigerated rooms, laundries, shipping and receiving platforms, foundries, and other locations where they will be exposed to tough usage.

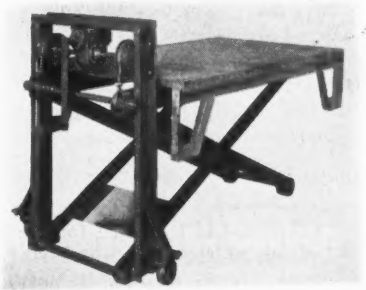
The terminals are built inside the cabinet, eliminating the possibility of short-circuiting and protecting them from wear.

WOOD SEALING COMPOUND

NON-RUST Chemical Corporation, Chicago, has perfected a new product for sealing moisture and sap in wood. Non-Rust Wood-Seal, as it is called, is said to be used wherever it is advantageous for wood to come in contact with steel or ferrous metal. It is recommended by the manufacturer for wooden skids, separators, planks, racks, boxes and crates used in the shipment or storage of steel sheets and shapes.

SKID LIFT TRUCK

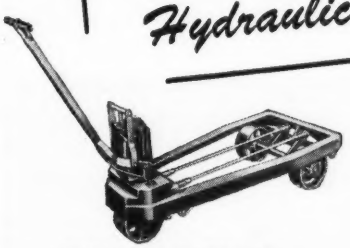
A HAND-OPERATED skid lift truck has been put on the



Whether it's a ✓SKID LOAD or a ✓PALLET LOAD...

You can handle it quickly, easily and cheaply with a

LYON-Raymond Hydraulic LIFT TRUCK



Platform Model for Skid Loads—All sizes and capacities.

Pallet Model, several capacities—for single or two-faced pallets.

Check These SUPERIOR FEATURES

- Fingertip lowering control.
- High underclearance—due to single frame construction.
- Self-contained Hydraulic Pump and Ram.
- 360° Turning and Operating Radius.
- One-piece, all-welded, steel frame.
- Timken Bearings in all wheels.

Here are the two most versatile trucks you could have in your plant. Useful in almost every department, or for inter-department transport. For servicing from storage alleys to main arteries, their size, easy maneuverability, design, and construction features fit the job perfectly. They'll pay for themselves quickly—and pay a profit for years to come!

• Ask for bulletin describing these trucks—Consult us on your Material Handling Problems.

LYON-Raymond CORPORATION

520 Madison St. Greene, N. Y.

LYON-Raymond Corporation
520 Madison St., Greene, N. Y.

Send me your Bulletin #127 on the Platform Model Truck
Bulletin #132 on the Pallet Model Truck

Company.....

Individual.....Title.....

Street.....City.....State.....

market by General Sales & Engineering Company, Chicago. The platform which holds the skid is 24" x 60⅝" and the truck is said to have a capacity of 1500 pounds. Extreme lowered height is 7", while maximum skid elevation is 33". Worm and worm wheel run in oil on ball bearings. Ball bearing swivel casters and ball bearing steel front wheels are also used.

CABLE-LIFT DEVICE

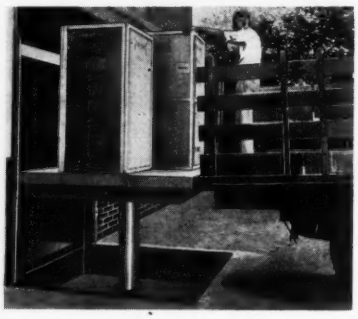
A CABLE-LIFT device for elevation of the delivery end of the Stevedore, Jr. series of its portable power belt conveyors has been developed by the Rapids-Standard Company, Inc., Grand Rapids, Michigan. Clockwise turning of the lifting crank, states the release, winds the cable over a drum and pulls the entire T-arm assembly forward on the main conveyor frame channel, thus elevating the delivery head end. Lowering is accomplished by releasing the safety ratchet pawl with one hand and turning the handle with the other hand. The entire lift assembly slides back on the frame channel and lowers the delivery head end.

MAGNESIUM DOCKBOARD

A LIGHT-WEIGHT magnesium dockboard is being produced by Magnesium Company of America Inc., Chicago. It is claimed that this board combines strength with light weight and that its use tends to reduce time lost through accidents. It can be obtained in either plain or non-skid raised-pattern floor plate, both reinforced with structural members which are designed to hold the dockboard securely in position.

HYDRAULIC LIFT

ROTARY LIFT COMPANY, Memphis, Tenn., has designed its new Oildraulic Levelator. Electric pumping or available compressed air can be used to force the oil into the jack; descent is by gravity. Loads up to 50,000 pounds can be lifted. Other sizes and capacities can be obtained according to individual plant requirements, it is stated.



ROTARY ACCUMULATING TABLE

IN ORDER to provide a reserve reservoir in a conveying system for excess bottles, jars, cans and other items being conveyed, the Island Equipment Corporation of New York City has placed on the market a Rotary Accumulating

WHY ENGINEERED DESIGN PALLETS?

$W = 1.95 \frac{sbd^2}{l}$ .... a flexure formula for determining the maximum permissable load on the deck boards of a pallet. An intimate working knowledge of the above and other more complicated design formulas is necessary to produce pallets basically sound for long life and low maintenance.

ENGINEERED DESIGN premises such a working knowledge.

Pallets Inc.

Manufacturers of **ENGINEERED DESIGN** *Pallets*

GLENS FALLS, NEW YORK
Telephone 2-2892

STANDARD PORTABLE PILERS MAKE EVERY INCH OF STORAGE SPACE HANDY

THE HANDIPILER

Loads, unloads, elevates, stacks—handles cartons, bags, other packages up to 100 lbs. Light weight. Completely portable and self-contained. Available in four heights; adjustable up to 7½, 8½, 9½, and 10½ ft.; in two widths with 14 inch and 24 inch belt.

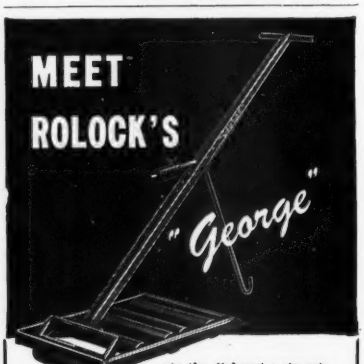
THE HANDIBELT

An all purpose incline, decline or horizontal belt portable conveyor. Handles boxes, cartons, crates, bags. Either end may be raised or lowered. Elevates from 10 inches to 6 feet 3 inches, or from 30 inches to 7 feet 6 inches or any angle between.

For complete information write for Bulletin FL-106

Standard Conveyor Company
North St. Paul 9, Minnesota

MEET ROLOCK'S "George"



ROLOCK's the "almost automatic" TOTE BOX TRUCK that simplifies movement of heavy box loads of metal parts. One user says "a great time saver . . . carries four to five times the amount handled previously . . . reduces wear of tote boxes." Two sets of ball-bearing rollers, one carries the load, other rolls truck to destination. Traction-hook slips into box handle, then "pull-back" leads load over beveled frame onto rollers. Fast, safe, energy saver. A smash hit . . . ask for Bulletin F.

ROLOCK, Incorporated, Fairfield, Conn.

LET "George" DO IT / TRADE MARK

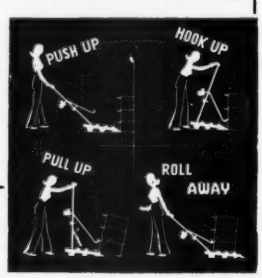
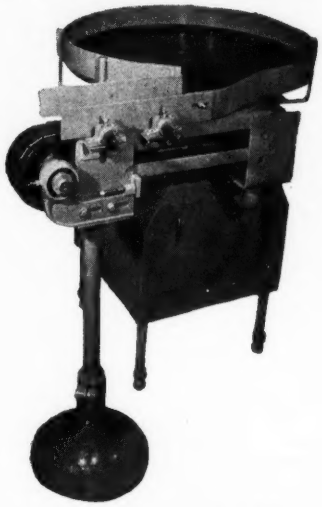


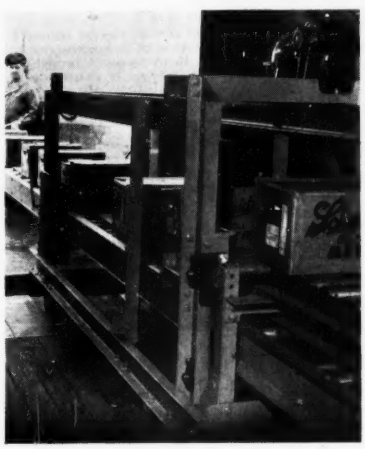
Table. A disc on top of a disc forms the carrying portion for the materials being conveyed in the circular



enclosure, which is motor driven to synchronize with the speed of the conveyor. A guard plate around the outer edge prevents the disc from falling off.

PORTABLE UNLOADING CONVEYOR

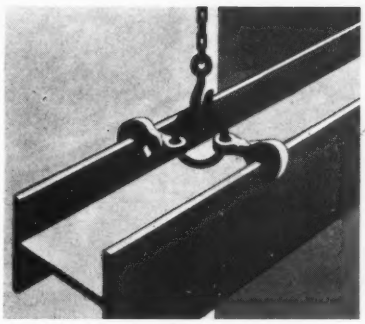
ACCORDING to a release, the Standard Conveyor Company, North St. Paul, Minn., makes a new "Projectoveyor," a cantilevered belt conveyor which can be projected into a trailer by one



man to any desired distance up to 19 feet. Powered by a ½ H.P. motor, it is said to operate in either direction, with no portable sections or supports required. The unit is made of aluminum and will handle a load of 20 pounds a foot when extended 19 feet. According to the manufacturer, the motor can be operated from a light socket.

STEEL LIFTING HOOK

A NEW hook for lifting such structural steel shapes as beams, girders, channels, etc., is announced by the Elizabeth Iron Works, Green Lane, Elizabeth, New Jersey. Torque-action pro-



vides gripping as the load suspended increases.

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OHIO

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Material Handling Equipment Co.	58	Ohio Equipment Co., Inc.	57

FOR HIGH OR LOW CEILINGS

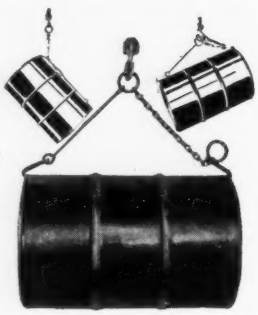
Item J-632
$32.00

Universal Grab

For picking up all types of heavy boxes, crates, bales or other loads where hooks may be used.

Made of heavy forged steel hooks with an adjustable spread which provides for handling of every size load from 16" to 48". Sturdy ⅜" BBB chains. Capacity 2000 lbs.

The heavier the load the tighter the grip. Let the "Universal Grab" do your heavy lifting, avoid accidents to your employees.



Item B-205
$12.50

Drum—Barrel Sling

Half-Ton Capacity

Will handle drum for draining purposes. Can pick up drum from lying position and set on end. Use for loading on or unloading truck and for general purpose handling. Will handle barrels, drums, kegs, anything with a lip such as on steel drum or wooden barrel. Simple in construction . . . easy to operate . . . heavily welded chain, forged grab hooks. Weight 8½ lbs. Air dry enamel finish.

$46.50

Item NS-298

Hand Dump Truck

Constructed of heavy sheet steel, reinforced with band at top edge, stout ⅝" round rod iron handle welded to truck. This truck measures 25¾" by 45" at the top and 25¾" by 27" at the bottom by 17½" deep—carries about ½ cu. yd. and weighs 125 lbs. Equipped with two 8" semi-steel wheels and two 4" metal swivel casters. Air dry enamel finish.

Wood Box—Metal Bound

"Tilt-Type"

A general utility push truck, "Tilt Type" for easy wheeling and short turning of corners. Built of all hard wood, completely metal bound, all welded construction, no bolts used. Two rigid and two swivel, 5" metal casters, ½" tilt. Metal parts air dry enamel finish, wood left natural.

TWO STANDARD SIZES

Item PS-91A **$32.45**
Box measures 24" wide, 36" long, 26" high, weight 185 lbs.

Item PS-91B **$36.85**
Box measures 28" wide, 48" long, 30" high, weight 260 lbs.

Hand Truck

With Safety Knuckle Guards

Made in two sizes, both sizes supplied with metal or rubber wheels.

Truck is provided with heavy nose plate extending 7" to insure easy pick-up, and secure resting platform for load. Adapted to heavy lifting where limited space prohibits the use of larger equipment. Made with angle iron framework, heavy iron cross bars, welded on.

Furnished with 8" x 2" roller-bearing wheels. Safety knuckle guards protect the operator's hands against injury.

TWO SIZES

Item B-491-M-S **$16.00**
18" wide, 42" high—metal wheels

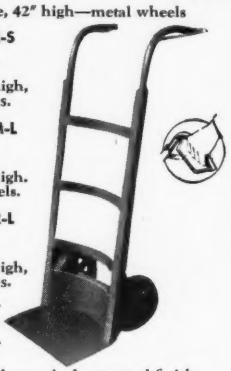
Item B-491-R-S
$20.00
18" wide, 42" high, —rubber tires.

Item B-491-M-L
$19.50
20" wide, 48" high. —metal wheels.

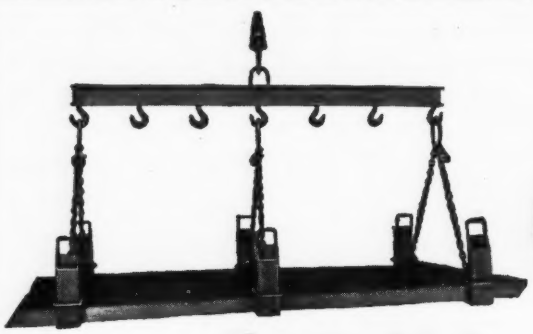
Item B-491-R-L
$22.50
20" wide, 48" high, —rubber tires.

Weight (S models) 60 lbs.

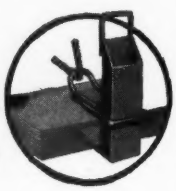
Weight (L models) 65 lbs.



All models are air dry enamel finish.

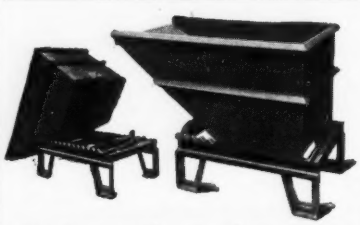


Item NS-364
Price Complete
$150.00



Sheet Steel Grab

For handling sheet steel in bundles of any size lift up to 9" thick, 18" to 48" wide, and any length. "Grabs" can be used single, double or triple according to size of bundle; illustration shows triple application. Capacity, one ton per "grab"—total, 3 tons. Holds sheets securely without slippage, distortion or damage to stock. Suited to high or low head room. Supporting beam measures 6' long. Heavily constructed. Weight 190 lbs.



Automatic End Dump

For Use With Lift Truck

For handling hot metal parts, scrap stampings, other heavy materials. Rockers geared to the truck. Self-seating, smooth operating. Built of heavy steel plate, reinforced with sturdy angles. All welded construction. Two standard sizes. Air dry enamel finish.

Item S-878-A **$105.00**
Capacity ½ cu. yd. Weight 600 lbs.

Item S-878-B **$115.00**
Capacity 1 cu. yd. Weight 750 lbs.

Be sure to give floor clearance of your lift truck when ordering.

We Design and build all types of Trucks, Skids, Pallets, Platforms, Racks, Boxes, Bins, Tables, for Pick-up, Loading, Moving, Shipping, Dumping and Storage.

When Ordering:

Always give "Item" number; this will help to prevent error. All weights are approximate. All prices are f.o.b. Detroit, Mich. Prices subject to change without notice.

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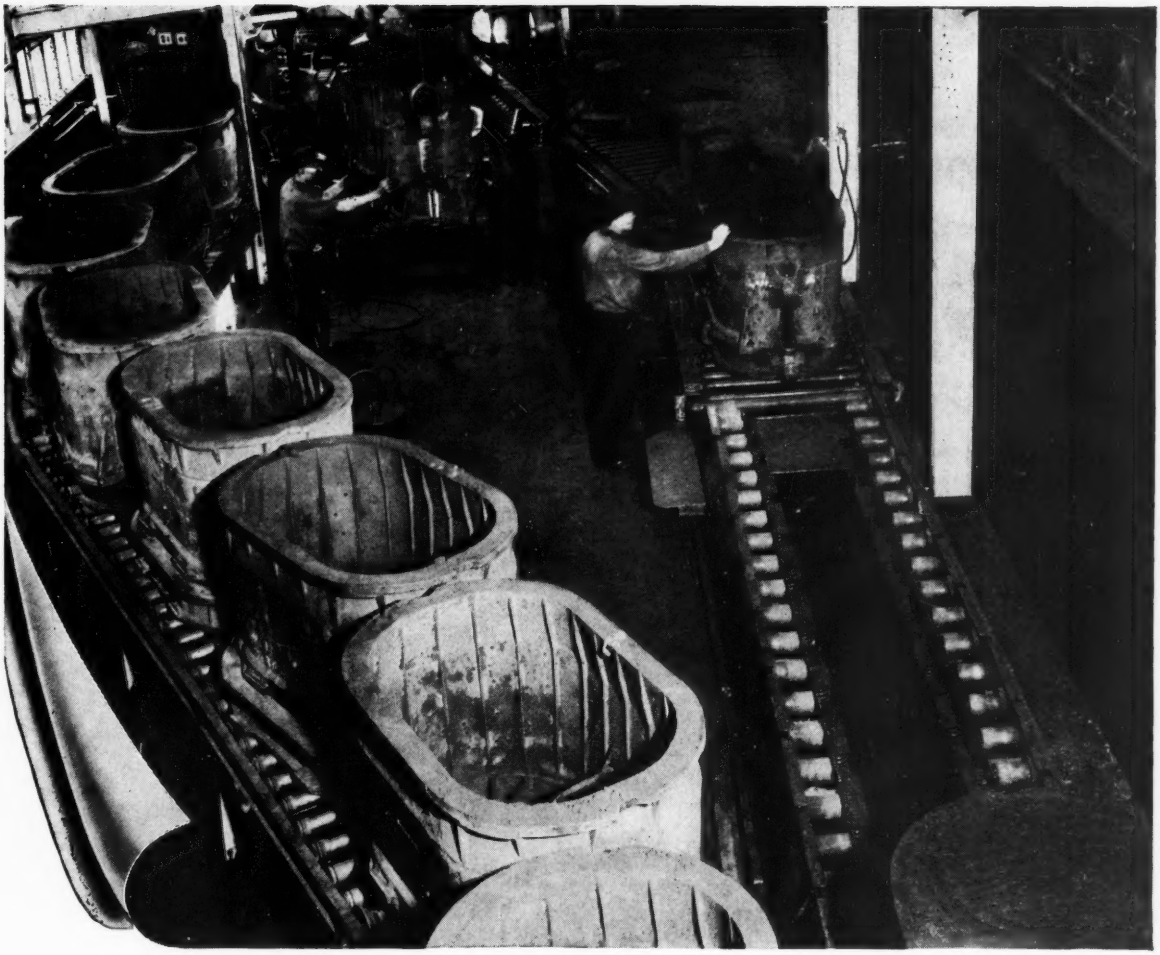
Palmer-Shile Co.

7170 W. Jefferson Ave., DETROIT 17, MICH.



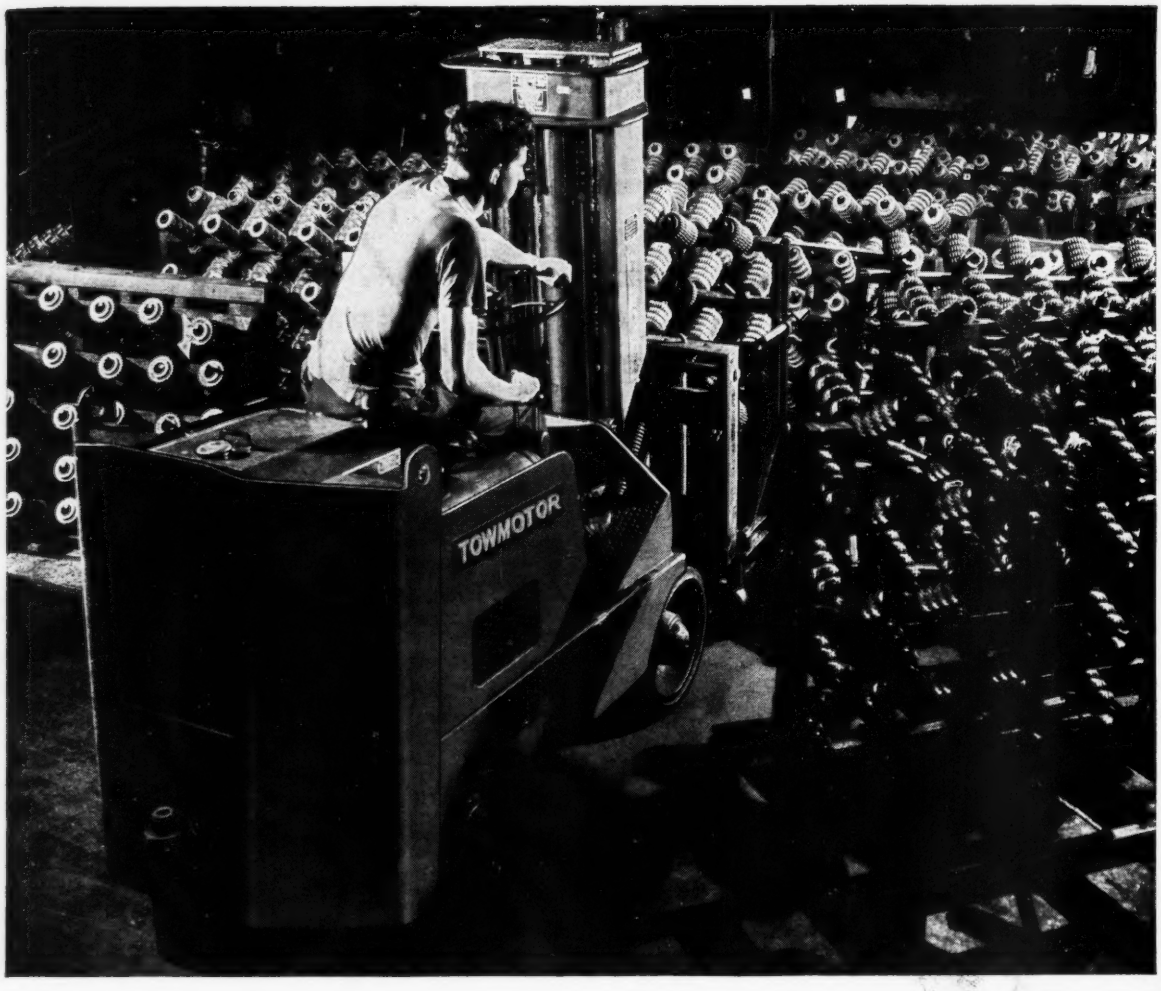
Mathews Methods are Paying *Dividends*

THE outstanding efficiency of manufacturers applying continuous flow handling methods provides proof that these methods are rendering real production service. Gravity and power conveyers and specially engineered conveying machinery usually are combined to make up Mathews Conveyer Systems. Such systems are an investment in greater output, lower costs, and improved employer-employee relations. The conveying equipment provides a steady flow of materials through processing machinery, and reduces manual handling and worker fatigue to a very minimum. It is designed to operate under severe service with very little maintenance attention, and into every section goes the finest of materials and manufacturing skill.

Mathews Engineers have acquired a wealth of experience in dealing with materials-handling problems. The benefit of this experience is readily available to you. Write or wire for field engineering service.

MATHEWS CONVEYER CO.

ELLWOOD CITY, PENNSYLVANIA



GEARED—TO CAPACITY PRODUCTION

MILLIONS OF GEARS—gears of many sizes and shapes, for a large variety of uses—are produced by Warner Gear Division, Borg-Warner Corporation. Mass production of this sort entails numerous handling problems, many of which are effectively solved by a fleet of eleven Towmotors.

On receiving docks, a single Towmotor handles all types of raw materials including 18-foot bar stock, keeps materials flowing to production departments. In the shop, Towmotors tier 5600-lb. loads three high to triple storage space, provide a simple answer to the perplexing problem of transporting 1200-lb. cyanide pots from heat-treating to storage. One unit often does the work of a ten-man gang.

In the shipping department, two Towmotors load 250,000 lbs. of gears daily, in addition to supplying loads for three interplant trucks. And to Towmotor's record for versatility and capacity can be added economical operation . . . operating costs for each unit total only one-quarter of the operator's wage.

For every handling problem, however unusual, there is an engineered solution . . . a solution based on Towmotor experience and "know-how" gained in solving handling problems in every industry. Send for your copy of the Towmotor Lift Truck ANALYSIS GUIDE. Towmotor Corporation, Div. 12, 1226 East 152nd Street, Cleveland 10, Ohio.

TAKE IT UP WITH

TOWMOTOR

THE ONE-MAN-GANG